



Operation Manual

(printable Help file)

April 8, 2004

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Introduction

Features



E Desk™ is a hardware and software based digital audio platform that provides multi-channel audio processing in analog and CobraNet™ applications. **E Desk** allows you to configure your entire system from microphones and line level inputs to the amplifiers by utilizing virtual processors (DSP).

When coupled with Whirlwind's other CobraNet compatible products such as **E Snake™** and the **E Mod™** series of CobraNet tranceivers, **E Desk** can provide a total digital audio networking solution. From small commercial applications, schools, churches, and theaters, to the largest stadiums, arenas, universities and industrial complexes, **E Desk** can handle them all.

ALGORITHMS

- Mixers: standard, automatic, matrix, combiners
- Equalizers: graphic, parametric, and feedback suppression
- Filters: HPF, LPF, high shelving, low shelving, all-pass
- Crossovers: 2-way, 3-way, 4-way
- Dynamics: levelers, comp/limiters, duckers, gates, ambient noise compensators
- Routers: 2x4 to 40x40
- Delays: 0 to 2,000 mS
- Controls: levels, mutes, presets, remotes, logic
- Meters: signal present, peak reading, RMS reading
- Generators: single tone, sweep, pink-noise, white-noise
- Diagnostics: transfer function

HARDWARE:

- Six 60 MHz 32-bit floating point Analog Devices SHARC DSPs (*360 MFLOPS*)
- 80 MHz 32-bit Motorola Power PC host processor
- 32 Mbytes SDRAM
- 8 Mbytes Flash ROM
- Ethernet communications for software control and configuration
- Support of TCP/IP, UDP and ICMP (*ping*) networking standards
- Battery backed real-time clock and calendar
- Powered CAN bus for easy addition of E Desk control devices; touch screens, rotary encoders, and contact switches
- RS-232 serial port for simple connection to 3rd party control devices
- Internal 80 watt universal switching power supply
- 8x8 analog I/O configuration
- Mic/Line inputs with programmable mic preamp (*0dB to ~ +66dB gain*)
- Optional CobraNet interface supporting 64 channels of digital audio (*32 in/32 out*) over Fast Ethernet
- Compatible with all other CobraNet compliant devices
- Works with standard Ethernet switches
- Multiple system-wide presets and current settings stored in flash memory
- Layout drawing information stored in flash memory
- 24-bit A/D & D/A converters

SOFTWARE:

- Win32 application - Windows NT 4.0/2000/XP operating system required
- Fully dockable Menu and Toolbar support
- Overview for easy panning and zooming of large layout files
- Fully customizable Equipment Room toolbar for storing default and custom DSP objects
- Workspace state saved at program shutdown, including current documents, Toolbar, Catalog & Overview states
- User configurable data file and Equipment Room catalog
- Simple object attribute control: colors, line widths, hatching, text font, size, style & alignment, border widths, etc.
- Multiple simultaneous line (*wire*) drawing with no special editing modes required
- Special text block object to enter freeform text and label information
- Easy-to-use tools for object alignment, sizing, packing, spacing & centering
- Fully supported object drag-and-drop between Catalog and view, and between views
- Fully supported multiple layers within a drawing
- Support of Clipboard operation
- Programmable presets
- Export file types: DXF (*drawing interchange format*) & EMF (*enhanced meta files*)

Architect's & Engineer's Specification

E Desk™ Digital Audio Platform

ARCHITECTS & ENGINEERS SPECIFICATION (February 1, 2004)

The Digital Audio Platform shall be an 8-in/8-out (8x8) hardware configuration. Inputs and outputs shall use internal 24-bit A/D & D/A converters operating at a sample rate of 48kHz. All internal processing shall be digital (DSP). Electronically balanced analog inputs and outputs shall be provided on plug-in barrier-strip connectors. Analog inputs shall be individually programmable to accept either microphone or line level signals. The hardware shall include six 60MHz 32-bit floating point SHARC DSPs, an 80MHz 32-bit Power PC host processor, 32MB SDRAM, and 8MB Flash ROM. Software shall be provided for creating/connecting DSP system components within each hardware unit. Available system components shall include (but not be limited to) various forms of: mixers, equalizers, filters, crossovers, dynamics/gain controls, routers, delays, level controls, level meters, and tone generators. Ethernet communications shall be utilized for software control, configuration, and DSP sharing. CobraNet(TM) technology shall transport digital audio over fast Ethernet, allowing multiple units to share digital audio. After initial programming, systems may be controlled using either TCP/IP or RS-232 serial communication by third party control systems such as AMX(TM) and Crestron(TM).

The E Desk 4040c shall be outfitted with CobraNet for multi-unit network applications and to expand total inputs and outputs to 40 channels. Multi-unit network applications require an external 10/100Base-T Ethernet switch. All CobraNet & Ethernet connections shall be via CAT5 cable or fiber-optic. Software shall operate on a PC computer, with network card installed, running Windows(TM) NT 4.0/2000/XP.

The Digital Audio Platform shall be E Desk.

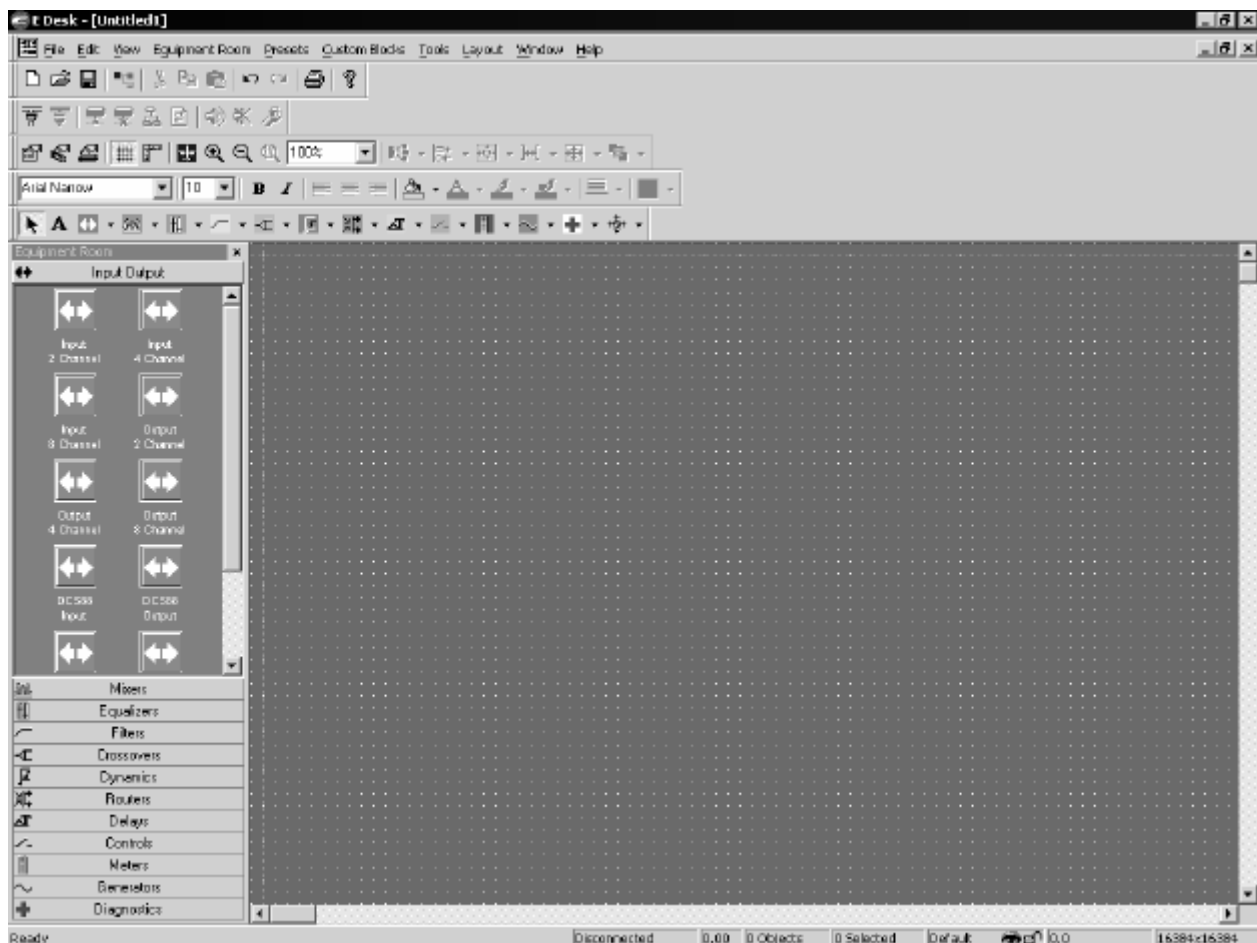
Documentation

The information contained in this Help file can be printed in manual form (with Table of Contents and Index). Two PDF documents are provided on the software CD-ROM for this purpose. The file **E Desk.pdf** is intended for printing on **Letter** (8.5" x 11") size paper. The file **E Desk-A4.pdf** is intended for printing on **A4** (210mm x 297mm) size paper. These are printable Help files. Similar PDF files are also available on the software CD-ROM, for the 'RS-232 & Telnet Protocol' and the 'Quick Start Guide & Safety Information' documents.

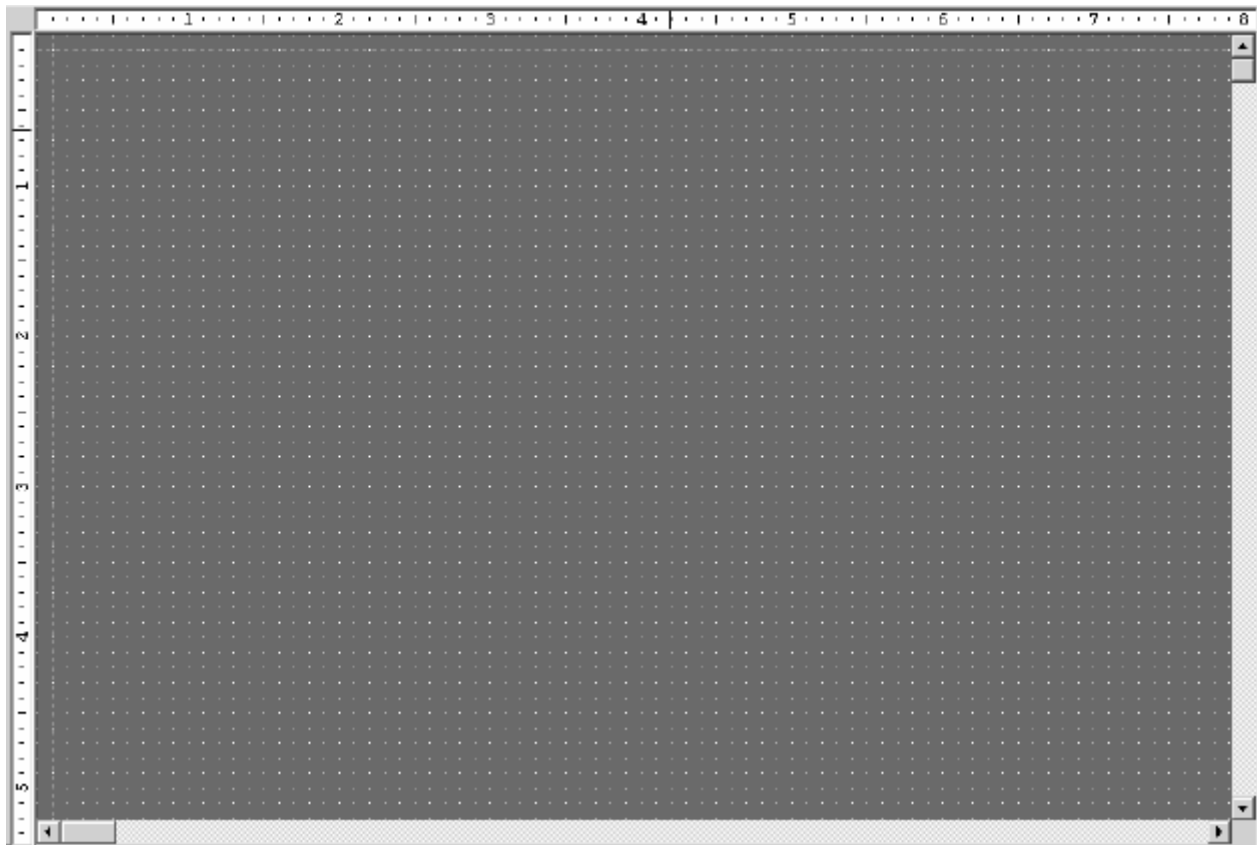
Software Tools

Basic Screen Elements

The main screen of the **E Desk™** software has several sections. The **Layout** occupies the largest portion of the main screen, at the lower-right. This is the area where system design actually occurs, with the placement & connection of Component Objects. Component Objects represent the individual audio devices (processing blocks) within the system. Other objects include Lines (for connecting components) and Text (for labeling the system). If a system becomes too big to fit the Layout, an **Overview** is available to aid navigation. An **Equipment Room** of available Component Objects is displayed, at the lower-left of the main screen, for drag & drop placement into the Layout. However, the Equipment Room can be closed, increasing the width of the Layout, and Component Object selection can then be accomplished using the **Object Toolbar**, located directly above the Layout. The Object Toolbar also provides the option of either a select or a text cursor. Above the Object Toolbar is the **Format Toolbar**, which allows customizing of text & colors used in the Layout and associated objects. Above the Format Toolbar is the **Layout Toolbar**, which affects certain aspects of Layout, such as the grid, rulers, zooming, & alignment of Component Objects. The Layout Toolbar can also open editing/information sheets for properties, objects, & layers. Above the Layout Toolbar is the **Network Toolbar**, with functions related to communications, configuration, maintenance, and testing of the system network. Above the Network Toolbar is the **Standard Toolbar**, with file functions such as new, open, & save, plus additional functions such as cut, copy, paste, print, & help. The Standard Toolbar also includes the **Compile** function, which will generate a new configuration file, while checking system layout/connections & determining DSP resource allocation. Above the Standard Toolbar are the **Main Menus**, which provides all of the toolbar functions mentioned above, with several more in-depth editing functions. Along the bottom edge of the main screen is a **Status Bar**, which gives indication of object quantity, location, & size, as well as layer name, visibility, & locking. The location and shape of all toolbars, including the Equipment Room, may be changed to fit the user's preference.

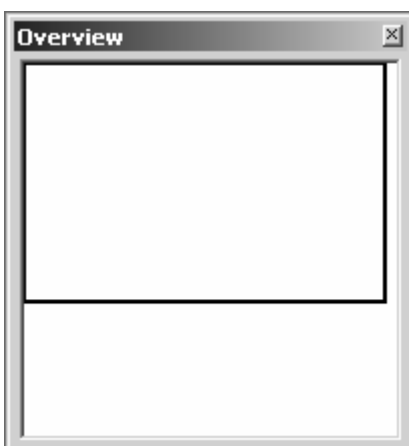


Layout



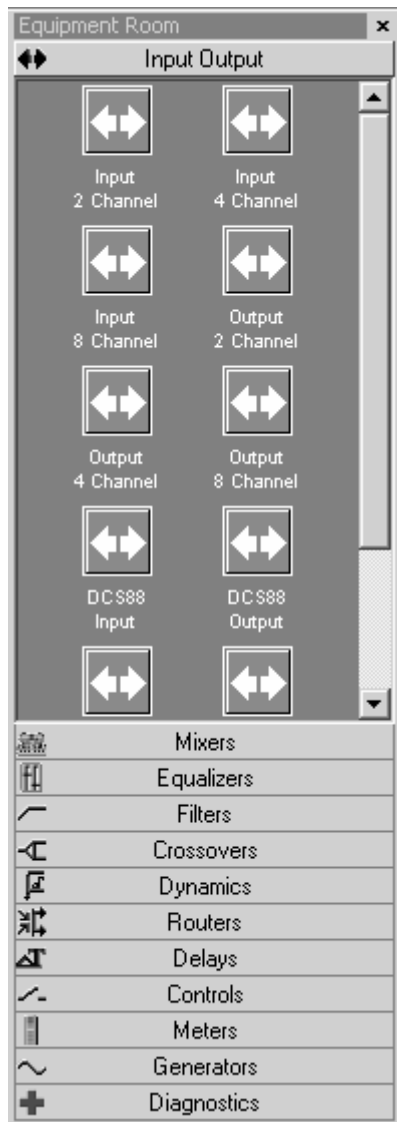
The Layout occupies the largest portion of the main screen, at the lower-right. This is the area where system design actually occurs, with the placement & connection of Component Objects. Component Objects represent the individual audio devices (processing blocks) within the system. Other objects include Lines (for connecting components) and Text (for labeling the system). Component objects can be placed into the Layout from the Equipment Room, the Object Toolbar, or the Equipment Room Menu. The Layout has fixed dimensions of 16384x16384 pixels (approx. 163.75" square). Therefore, horizontal & vertical scroll bars are used to navigate within the Layout. Zoom In/Out and an Overview are also available as navigational aids, and can be accessed from the Layout Toolbar or View Menu. The Ruler and Grid may be turned on/off from the Layout Toolbar, and the background color of the Layout may be changed from the Format Toolbar. Grid Settings, such as snap-to-grid, grid spacing, and guideline spacing, are available from the Layout Menu. Minimize, Down-Size, and Close buttons for the Layout are located in the upper-right corner of the main screen. Right-clicking over the Layout provides a pop-up menu of options.

Overview



The Overview provides a thumb-nail sketch of the entire system design, to aid navigation within the Layout. Overview initially covers an area of only 8" x 5", but will automatically increase size to cover a larger system design. A black rectangle frames the viewable area. The rectangle may be dragged to view any location within the system design. The rectangle also has handles to re-size the viewable area, from a minimum of 4" x 2.5" to a maximum of 16" x 10".

Equipment Room



An Equipment Room of available Component Objects is displayed, at the lower-left of the main screen. The Component Objects are organized in the following categories: Input Output; Mixers; Equalizers; Filters; Crossovers; Dynamics; Routers; Delays; Controls; Meters; Generators; and Diagnostics.

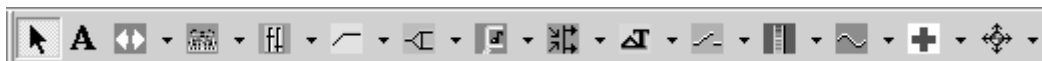
Once a category is selected, the pre-defined components available from that category will be displayed underneath the category heading. A vertical scroll bar will appear on the right if the available components cannot all be displayed. To place a Component Object, simply drag & drop it into the Layout at the desired location. Customized and grouped components may be added to the Equipment Room (see Customizing Component Objects).

The Equipment Room may be closed, thereby increasing the width of the Layout, and components can instead be selected from the Object Toolbar. The Object Toolbar also allows configuration of some components, as they are placed into the Layout.

To close the Equipment Room, left-click on the 'X' in the upper-right corner. The Equipment Room can again be opened by selecting any component category from the Equipment Room Menu. The Equipment Room can also be opened/closed from the View Menu.

Right-clicking over the Equipment Room provides a pop-up menu of options. The location and shape of all toolbars, including the Equipment Room, may be changed to fit the user's preference.

Object Toolbar



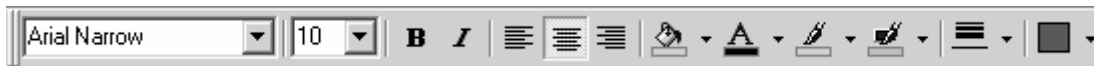
The Object Toolbar, located directly above the Layout, allows Component Object selection for placement into the Layout. The Component Objects are organized in the following categories: Input Output; Mixers; Equalizers; Filters; Crossovers; Dynamics; Routers; Delays; Controls; Meters; Generators; Diagnostics; and Specialty.

Each category is represented by an icon, with a drop-down menu to the right. To place a Component Object, first choose the appropriate category, then select the desired component from the drop-down menu. Once the component has been selected, simply left-click at the desired location on the Layout. Left-clicking a category icon will select the component which occurs first in the menu list. When using the Object Toolbar to place components into the Layout, certain components will present the user with a pop-up window of configuration options.

The Object Toolbar also provides the option of either a select cursor or a text cursor. The select cursor is for component selection, placement, wiring, etc. The text cursor is for placing Text Objects into the Layout, for system design labeling purposes.

When using the Object Toolbar, the Equipment Room may be closed, increasing the width of the Layout. The Object Toolbar may be opened/closed from the View Menu. The location and shape of all toolbars may be changed to fit the user's preference.

Format Toolbar



The Format Toolbar allows customization of text & colors used in the Layout and associated Component, Line, & Text Objects. The available tools are: Font; Size; Bold; Italics; Align Left; Center; Align Right; Back Color; Text Color; Fore Color; Hilite Color; Pen Width; and Hatch Style. The Format Toolbar may be opened/closed from the View Menu. The location and shape of all toolbars may be changed to fit the user's preference.

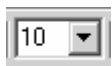
Tools

Font



Provides a drop-down menu of lettering styles for use in Component or Text Objects.

Size



Provides a drop-down menu of lettering sizes for use in Component or Text Objects.

Bold



Changes the selected text to a thicker version of the chosen font.

Italic



Changes the selected text to an italicized version of the chosen font.

Align Left



Aligns the selected text to the left margin of the Component or Text Object.

Center



Centers the selected text between the left and right margins of the Component or Text Object.

Align Right



Aligns the selected text to the right margin of the Component or Text Object.

Back Color



Provides a drop-down menu for changing the background color of the Layout, or of selected Component or Text Objects.

Left-clicking the icon applies the color which was selected last.

Text Color



Provides a drop-down menu for changing the text color in selected Component or Text Objects.

Left-clicking the icon applies the color which was selected last.

Fore Color



Provides a drop-down menu for changing the color of the lower and right borders, as well as any internal Hatching, of the selected Component, Line, or Text Objects.

Left-clicking the icon applies the color which was selected last.

Hilite Color



Provides a drop-down menu for changing the color of the upper and left borders of the selected Component or Text Objects.

Left-clicking the icon applies the color which was selected last.

Pen Width



Provides a drop-down menu for changing the width of line used for the borders of the selected Component, Line, or Text Objects.

Left-clicking the icon applies the width which was selected last.

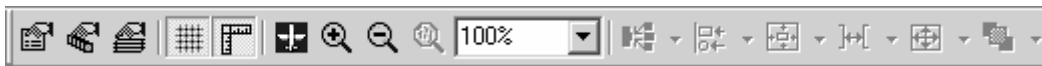
Hatch Style



Provides a drop-down menu for changing the hatching style within the selected Component or Text Objects.

Left-clicking the icon applies the style which was selected last.

Layout Toolbar



The Layout Toolbar affects certain aspects of Layout, such as the grid, rulers, zooming, & alignment of Component Objects. The Layout Toolbar can also open editing/information sheets for properties, objects, & layers. The available tools are: Property Sheet; Object Inspector; Layers Sheet; Toggle Grid; Toggle Ruler; Overview; Zoom In; Zoom Out; Zoom 1:1; Zoom Level; Pack Objects; Align Edges; Center In View; Space; Make Same Size; and To Front Or Back. The Layout Toolbar may be opened/closed from the View Menu. The location and shape of all toolbars may be changed to fit the user's preference.

Tools

Property Sheet



Provides an editable table of attributes regarding the Layout and its associated objects. Only Display Attributes are shown for the Layout (and Lines). Both Display and DSP Attributes are shown for Component Objects.



see Layout Property Sheet

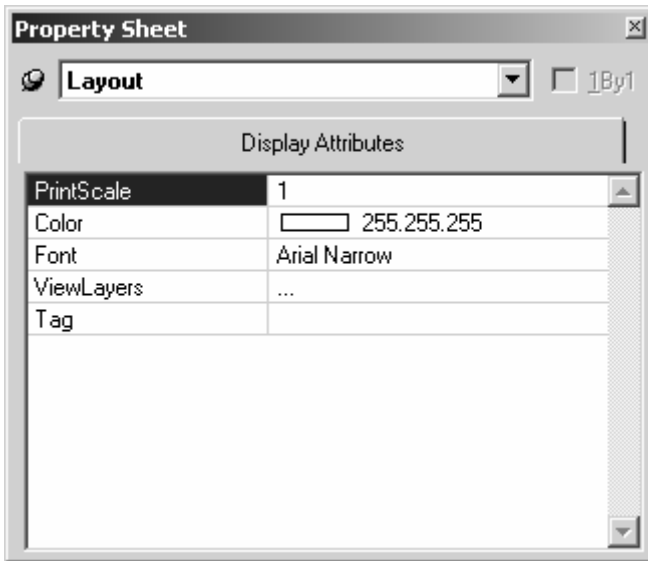


see Line Property Sheet



see Object Property Sheet

Layout Property Sheet

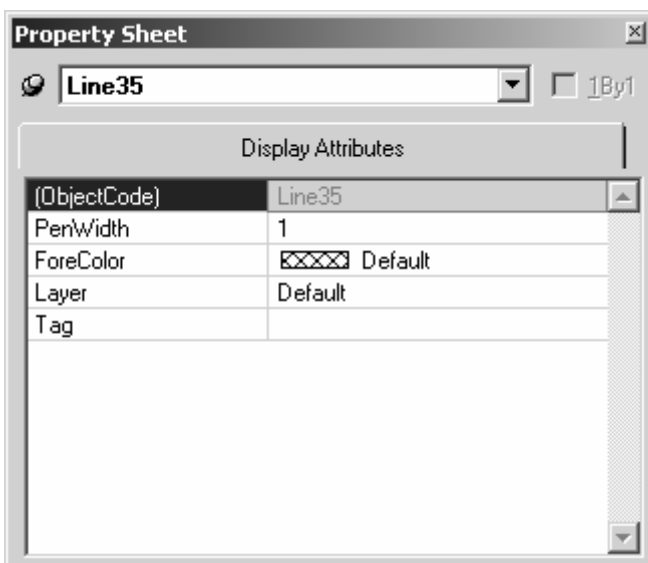


Provides an editable table of attributes regarding the Layout. Only Display Attributes are shown for the Layout. Most Display Attributes duplicate functions found in the Format Toolbar. However, some exceptions are as follows:

PrintScale is entered as decimal information, where 0.5 = 50% or 2.0 = 200%. **ViewLayers** opens the Layers Sheet. **Tag** is for user comments or other identifying text.

The **thumb-tack** (upper-left) allows the Property Sheet to remain open while selecting other objects. **1By1** (upper-right) allows any group of selected components (multi-selection) to appear on the menu.

Line Property Sheet



Only Display Attributes are shown for Lines (component connections). Most Display Attributes duplicate functions found in the Format Toolbar. However, some exceptions are as follows:

Object Code is a non-editable identifier. **Layer** determines which layer the Line is assigned to. **Tag** is for user comments or other identifying text.

The **thumb-tack** (upper-left) allows the Property Sheet to remain open while selecting other objects. **1By1** (upper-right) allows any group of selected components (multi-selection) to appear on the menu.

Object Property Sheet

(ObjectCode)	Mixer1
Left	130
Top	10
Width	90
Height	100
Text	Auto Mixer
Alignment	1 - Center
Font	Arial Narrow
PenWidth	1
BackColor	255.0.0
TextColor	XXXXX Default
ForeColor	XXXXX Default

Property	Value
Allocated To Unit	1
Allocated To Gang	0
Fixed In Unit	No
Instance ID	15
Password Level	Designer
Delay Equalization	Yes
Channel	Channel 1
Input Gain (dB)	0
Phantom Power	OFF
Input	Unmuted
Input Level (dB)	0.0
Inverted	No

Both Display and DSP Attributes are shown for component objects.

Most Display Attributes duplicate functions found in the Format Toolbar. However, some exceptions are as follows:

Object Code is a non-editable identifier. **Left, Top, Width, & Height** specify object location and size (in pixels). **Layer** determines which layer the component is assigned to. **Tag** is for user comments or other identifying text.

Most DSP Attributes duplicate functions found in the individual component Control Dialog boxes (see Component Object Properties). However, some exceptions are as follows:

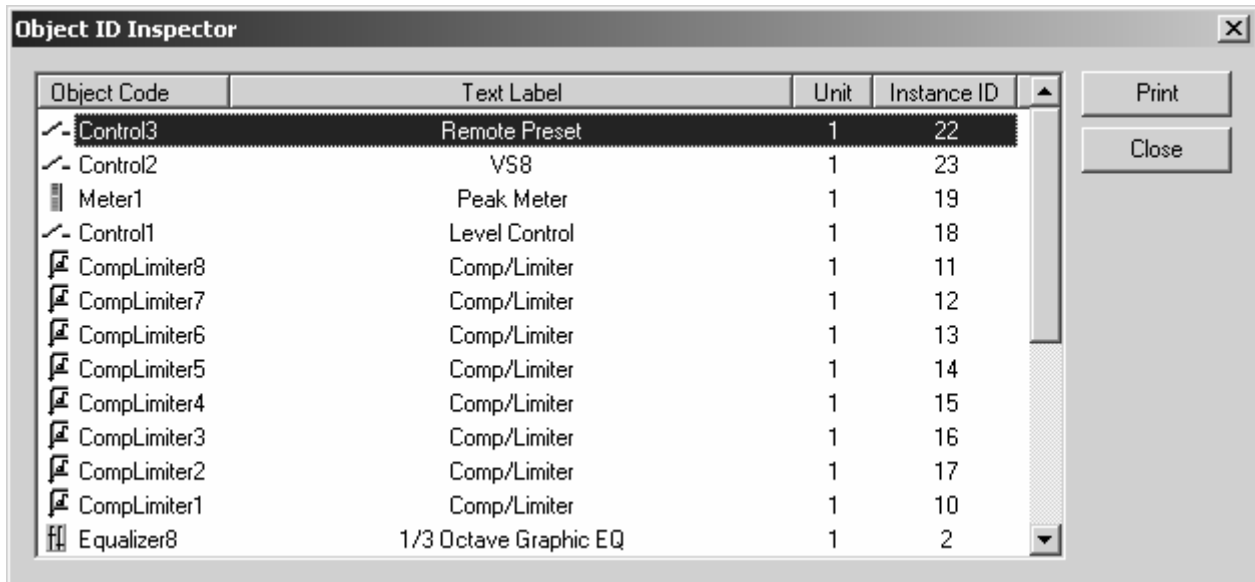
Allocated To Unit assigns the component (DSP block) to a particular unit in the system. **Allocated To Gang** assigns multiple components (DSP blocks) to a common 'gang', forcing them to be grouped into the same unit. **Fixed In Unit** prevents changes to Allocated To Unit and Allocated To Gang. **Instance ID** is the system-wide identifier number for the component (DSP block). **Password Level** selects either Designer or Technician access level, for individual components. **Delay Equalization** turns on/off compensation for propagation delay (Input Output components only). **Internal Propagation Delay** determines Delay Equalization for third-party converters (CobraNet I/O components only). See System Compiling Considerations. **Channel Identifier** allows labeling of the individual inputs/outputs on a component. This labeling appears only when the cursor is over the associated node.

The **thumb-tack** (upper-left) allows the Property Sheet to remain open while selecting other objects. **1By1** (upper-right) allows any group of selected components (multi-selection) to appear on the menu.

Object Inspector



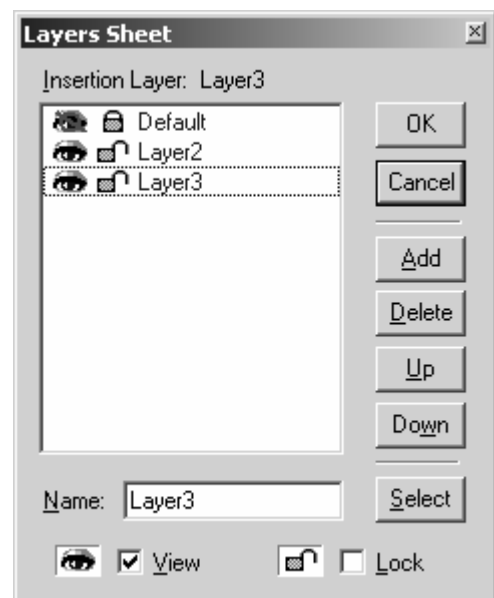
Provides a list of all objects within the Layout, along with their Object Codes, Text Labels, Unit numbers, and Instance ID numbers.



Layers Sheet



Provides an editable table of Layer properties. Layers can be used to separate a Layout into multiple parts. The Layers can be organized with regards to object types, system segments, or any other criteria. The Default Layer always remains, but other Layers may be created or removed, using **Add & Delete**. Layers may be selected directly from the list. **Up & Down** change the position of a Layer in the list only (Layers are not stacked, so this does not affect Tab Order or visual overlapping). All objects in a given Layer can be selected with **Select**. Added Layers can be given a custom **Name**. **View** turns on/off visibility of a Layer in the Layout. **NOTE:** *Components cannot be selected when the current Layer is invisible.* **Lock** prevents a Layer from being changed or selected. Lock & View may also be accessed by double-clicking on the corresponding icons within the list.



Toggle Grid



Turns Layout Grid on/off.

Toggle Ruler



Turns Layout Ruler on/off.

Overview



Turns Overview on/off.

Zoom In



Increases magnification of Layout in 25% increments.

Zoom Out



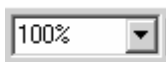
Decreases magnification of Layout in 25% increments.

Zoom 1:1



Returns magnification of Layout to 100%.

Zoom Level



Provides a drop-down menu of available Zoom magnifications (50% ~ 200% in 25% increments).

Pack Objects



Provides a drop-down menu for packing selected objects next to each other. The target location for packing left/right is the top-most selected object. The target location for packing top/bottom is the left-most selected object.



Left-clicking the icon applies the packing which was selected last.

Align Edges



Provides a drop-down menu for aligning the edges of selected objects. The primary selected object (green handles) provides the target edges for alignment.

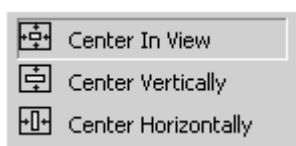


Left-clicking the icon applies the alignment which was selected last.

Center In View



Provides a drop-down menu for centering the Layout view on the selected objects.

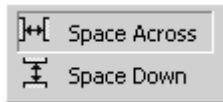


Left-clicking the icon applies the centering which was selected last.

Space



Provides a drop-down menu for evenly spacing selected objects. Spacing is determined between the two most distantly spaced selected objects.

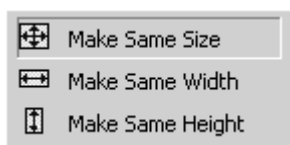


Left-clicking the icon applies the spacing which was selected last.

Make Same Size



Provides a drop-down menu for matching the dimensions of selected objects. The primary selected object (green handles) provides the target dimensions. Objects cannot be smaller than original size.

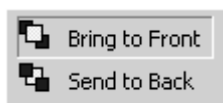


Left-clicking the icon applies the sizing which was selected last.

To Front Or Back



Provides a drop-down menu for changing the order in which overlapping objects appear on the Layout. The selected object(s) will either move in front of overlying objects, or will move behind underlying objects.



Left-clicking the icon applies the direction which was selected last.

Network Toolbar



The Network Toolbar provides functions related to communications, configuration, maintenance, and testing of the system network (see System Network Considerations).

Network Toolbar function includes: Connect; Disconnect; Connect To System; Disconnect From System; Send Configuration; Sync Data; Start Audio; Stop Audio; and Device Maintenance.

Tools

Connect



Establishes communication with, and provides a list of, all **E Desk™** devices on the network. Opens System Connect dialog box (see System Network Considerations). No system design data is transmitted or retrieved.

Disconnect



Ends communications with all **E Desk™** devices on the network. See System Network Considerations.

Connect To System



Establishes communication with, and retrieves data from, selected **E Desk™** systems on the network. Opens System Connect dialog box (see System Network Considerations). Password protection is then available from the Tools Menu. When connected to a system, Component Object Properties may be changed, but system design (objects & connections) cannot.

Disconnect From System



Ends communications with selected **E Desk™** systems on the network. See System Network Considerations. System design data is retained in software after disconnect.

Send Configuration



Transmits system design data to selected **E Desk™** devices in the system. See System Network Considerations. Before data can be transmitted, a system design file (.DAP) must first be opened, then connected to a system, and have **E Desk** device IP addresses assigned (see Device Maintenance). Send Configuration will automatically Compile the system design, and reset the hardware devices, before sending the new configuration.

Sync Data



Re-synchronizes the software with all connected **E Desk™** devices in the system.

***NOTE:** An 'Auto-Update' feature now allows software to detect system changes, and automatically re-synchronize with the devices where changes have occurred.*

Start Audio



Enables audio signal flow within the selected system. See System Network Considerations. Start Audio is available only after Send Configuration has been successfully performed.

Stop Audio



Disables audio signal flow within the selected system. See System Network Considerations.

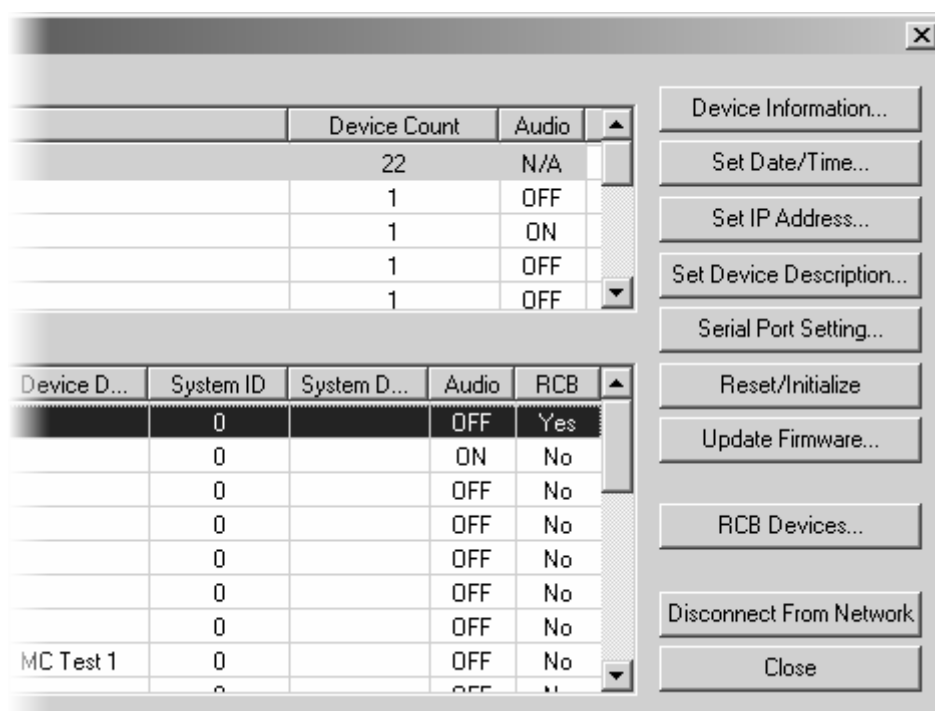
Device Maintenance



Provides an editable table of network related settings for selected **E Desk™** devices.

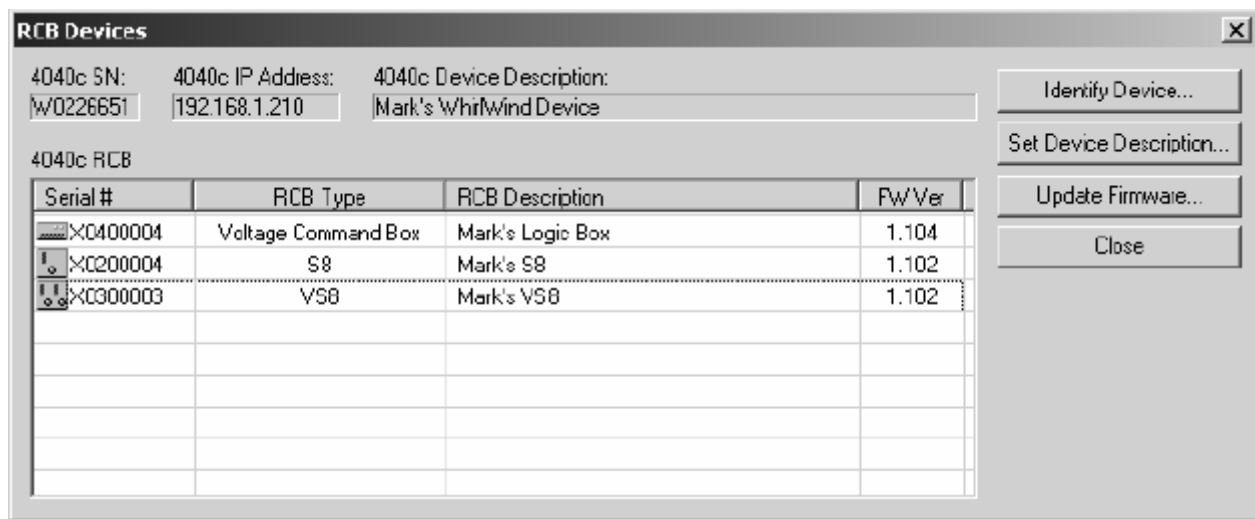
Opens Device Maintenance dialog box. Device Maintenance settings include Date/Time, IP Address, Description, Serial Number, Reset/Initialize, Update Firmware, and Disconnect From Network. (See System Network Considerations.)

Device Maintenance Dialog Box

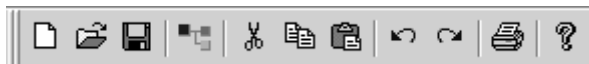


Device Information provides information (such as firmware version, input/output configuration, etc.) regarding the selected device. **Set Date/Time** allows update of the internal real-time clock. **Set IP Address** assigns a device IP Address such as **169.254.1.X** (where range of X = 1~254). The factory default IP Address is 169.254.1.200. However, IP Addresses cannot be duplicated, even in simple (**E Desk™** only) networks, and must be carefully managed when network topology is more complex. **Set Device Description** allows the selected device to be given a descriptive name. **Serial Port Setting** determines the baud rate of RS-232 communications (currently fixed at 38,400). **Reset/Initialize** clears all current system design data from the selected device. This happens automatically whenever a new system design file (.DAP) is uploaded (see Send Configuration). **Update Firmware** uploads flash update files (.JAM) to the selected device.

RCB Devices opens a list of devices connected to the Remote Control Bus of the selected **E Desk** device. **Identify Device** causes indicators on the selected device to flash (for physical location). **Set Device Description** allows the selected device be given a custom name. **Update Firmware** allows future firmware updates to be loaded into the selected device. The information in this list (including Serial #) is used to establish proper association between the external physical controls and their corresponding component counterparts in the layout (see Equipment Table).



Standard Toolbar



The Standard Toolbar provides file functions such as New, Open, & Save, plus additional functions such as Cut, Copy, Paste, Undo, Redo, Print, & Help. The Standard Toolbar also includes the Compile function, which will generate a new configuration file, while checking system layout/connections & determining DSP resource allocation. See File Menu and Edit Menu for more options.

Tools

New



Begins a new **E Desk™** system design file (.DAP).

Open



Opens an existing **E Desk™** system design file (.DAP).

Save



Saves the current **E Desk™** system design file (.DAP).

Compile



Provides system design analysis and calculates DSP processing requirements. Makes initial determinations of quantity/type of **E Desk™** devices needed, **CobraNet™** channel assignments, and allocation of DSP resources. Also provides indication of system design errors. There are two compilation modes: Quick and Extended. Generally, in the Quick mode the compilation takes less time, but it may not find the best solution or not find any solution. In the Extended mode, the compiler performs more profound analysis of the system design and may find a solution even if none was found in the Quick mode.

The Compile button on the Standard Toolbar normally launches the Quick mode by default. If the Ctrl key is pressed when the Quick command is selected (from either the Standard Toolbar or the File Menu) the Compiler is launched in Extended mode. See System Compiling Considerations.

Cut



Removes the selected object(s) from the Layout, and places them in the Clipboard.

Copy



Places a copy of the selected object(s) into the Clipboard.

Paste



Places a copy of the object(s) from the Clipboard into the Layout.

Undo



Will undo last operation.

Redo



Will redo most recent Undo operation.

Print



Opens a print dialog box, to adjust printer settings and print the Layout.

Help



You're looking at it.

Main Menus



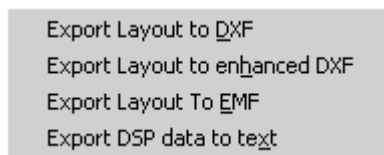
The Main Menu provide most of the toolbar functions mentioned previously, in Basic Screen Elements, as well as several more in-depth functions. Main Menu includes the following individual menus: File; Edit; View; Equipment Room; Presets; Custom Blocks; Tools; Layout; Window; and Help. Keyboard shortcuts are shown on the menus, where applicable.

File Menu

Export

Allows the **E Desk™** Layout to be exported in different file formats. DXF format is for use with CAD programs.

EMF (Enhanced MetaFile) is for insertion as a picture into documents such as Word & PowerPoint. DSP Data to Text provides signal processing data in Text file format.



Close

Closes and saves the current **E Desk™** system design file.

Save As

Saves the current **E Desk™** system design file (.DAP), with choice of directory location and file name.

Network

Most Network Menu items duplicate functions found in the Network Toolbar, except for **Send Control Dialog Layout Information**, which allows open (or minimized) control dialog box settings to be updated/saved to the hardware device.

See Component Object Properties and Software User Interface.



Print Preview

Previews printing results based on Print Setup.

Print Setup

Opens a print dialog box to adjust printer settings.

Recent File

Provides a list of recently saved files for convenient access.

Exit

Closes the **E Desk™** software program.

Also provides prompt to save the current

E Desk system design file if necessary.

If a file is open during Exit, that file will automatically open at next session.

Edit Menu

Copy DSP Data

Places a copy of the DSP data from the selected object into the Clipboard. DSP Data represents the current settings of that Component Object. See Component Object Properties.

DSP Data can be copied from only one Component Object at a time.

NOTE: *Software now supports Copy/Paste DSP Data between objects which are of the same type, but which have different sized configurations.*

Examples: 4x4 & 8x8 Matrix Mixers; 3-band & 5-band Parametric EQ.

Paste DSP Data

Places a copy of the DSP data from the Clipboard into the selected Component Object. DSP Data represents the current settings of that Component Object. See Component Object Properties.

DSP Data can be pasted simultaneously into multiple Component Objects.

NOTE: *Software now supports Copy/Paste DSP Data between blocks which are of the same type, but which have different sized configurations.*

Examples: 4x4 & 8x8 Matrix Mixers; 3-band & 5-band Parametric EQ.

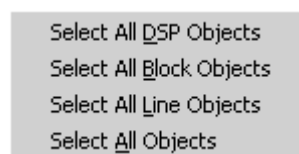
Duplicate

Places a copy of the selected Component or Text Object directly into the Layout. Duplicate also places a copy of the object into the Clipboard. Duplicate works with only one object at a time.

Select All

Provides an easy way to select all objects on the Layout.

Also allows all objects of a specific type to be selected.



Delete

Removes the selected object(s) from the Layout, without placing a copy into the Clipboard.

Control Dialog

Opens a Control Dialog box for the selected Component Object.

Control Dialog boxes provide a graphic means of displaying and adjusting Component Object settings. See Component Object Properties.

View Menu

Toolbars provides a drop-down menu to turn on/off any of the toolbars (see Basic Screen Elements). Status Bar, Ruler Bars, Zoom, & Overview select those functions, as found on the Layout Toolbar.



Equipment Room Menu

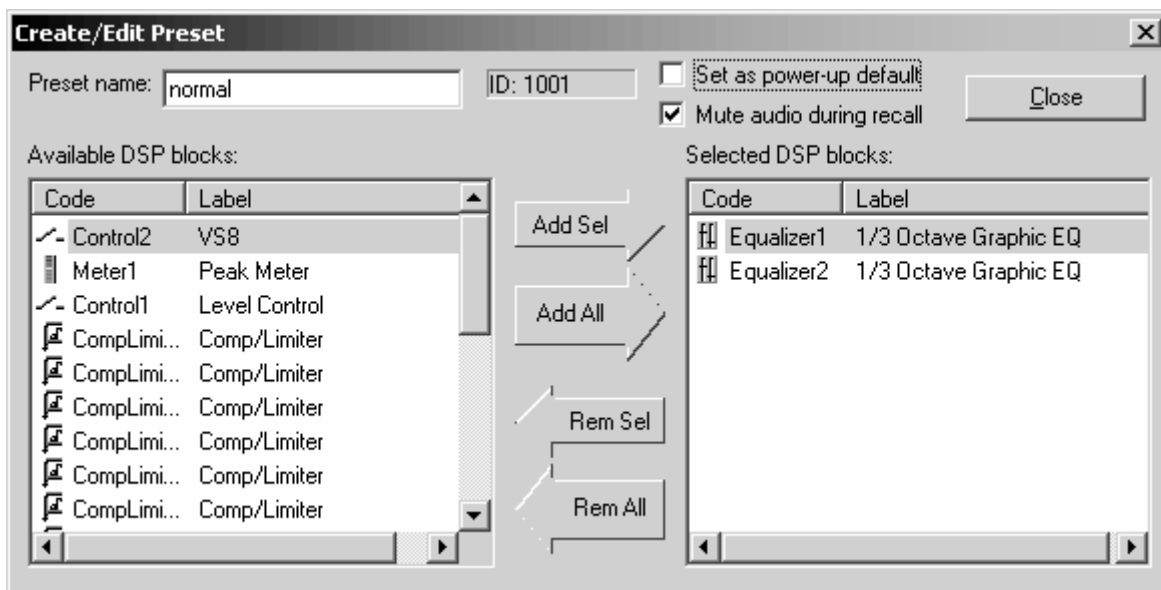
Provides a list of Component Object categories from the Equipment Room. When a category is selected from the menu, the Equipment Room opens to that category automatically.

Input/Output	Shift+Z
Mixers	Shift+X
Equalizers	Shift+E
Filters	Shift+F
Crossovers	Shift+C
Dynamics	Shift+D
Routers	Shift+R
Delays	Shift+L
Controls	Shift+T
Meters	Shift+M
Generators	Shift+G
Diagnostics	Shift+N

Presets Menu

Create/Edit/Recall

Provides the Create/Edit Preset dialog box, for creating, editing, saving, and recalling presets. Each preset can have a custom **Preset Name**, and will automatically be assigned a **Preset ID** number. A check-box is provided to assign the selected preset to be **Set As Power-Up Default**. This preset will automatically be recalled each time the system is powered up. A check-box is also provided to assign the selected preset to **Mute Audio During Recall**. If audio is not muted during recall, some processing noises may be audible. Component Objects (DSP Blocks) may be selected, and added or removed from any preset using the **Add Sel**, **Add All**, **Rem Sel**, and **Rem All** buttons. Therefore, presets may be customized to affect Component Objects individually, in groups, or as an entire system. Initially, all Component Objects in the Layout will be selected (included in the preset). Individually selected components become highlighted in the layout. Right-clicking the selected component allows it to be located in the layout and its control dialog to be opened. These features make it easy to change individual component settings within the preset being created/edited.



A tab at the upper-right of the Create/Edit Preset dialog box provides additional functions. **Next ID** and **Prev ID** allow selection from a list of existing presets. **Recall** retrieves all settings stored in the selected preset. **New** selects the next available Preset ID, for creation of a new preset. **Save** will over-write the selected Preset ID with all changes, including Preset Name. **Save As** will write changes into the next available Preset ID. **Delete** will remove the selected preset from memory. **Send** will send all saved presets to the E Desk™ devices in the system. **NOTE:** Be sure to use Recall before attempting to edit an existing preset. Otherwise, the preset could be over-written with settings from a previous preset, and any settings made since it was recalled.

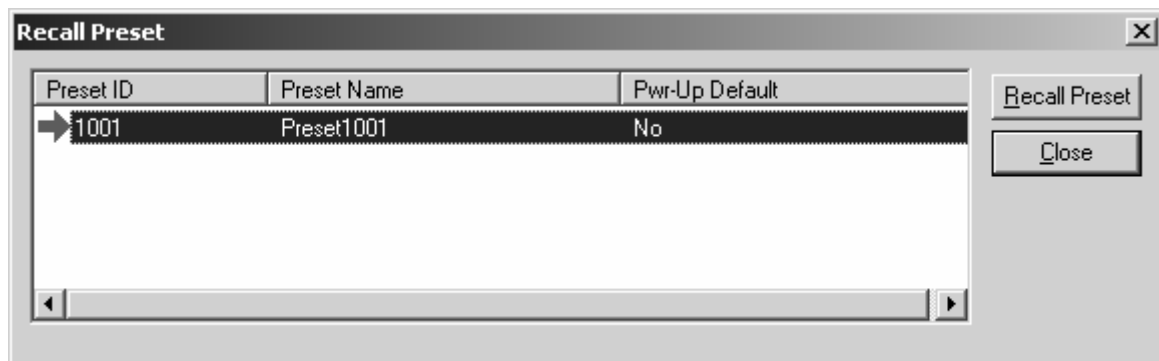
A tab at the lower-left of the Create/Edit Preset dialog box provides a list of existing presets. Left-clicking selects a preset. Double-clicking recalls a preset (as indicated by a green arrow to the left).



Preset ID	Preset Name	Pwr-Up Default	Mute On Recall	
1001	Preset1001	Yes	Yes	
1002	Preset1002	No	Yes	
→ 1003	Preset1003	No	Yes	
1004	Preset1004	No	Yes	

Recall

Provides the Recall Preset dialog box, for recalling existing presets. **Recall Preset** will retrieve all settings stored in the selected preset. Presets can also be recalled using components called Preset Buttons and Remote Preset Buttons, which can be placed into the Layout from Controls on the Object Toolbar.

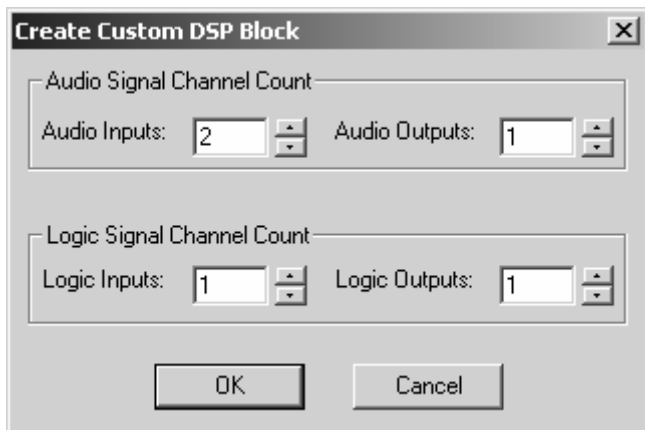


Custom Blocks Menu

Multiple component objects may be merged into a single custom block.

Custom Blocks can simplify the design process by integrating frequently used component combinations, and provide password protection for intellectual property such as unique processing and component settings.

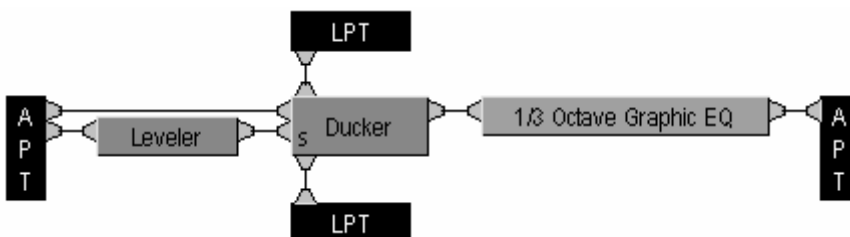
Create Custom Block Document



The dialog box is titled "Create Custom DSP Block" and has a close button (X) in the top right corner. It contains two sections: "Audio Signal Channel Count" and "Logic Signal Channel Count". In the Audio section, "Audio Inputs" is set to 2 and "Audio Outputs" is set to 1. In the Logic section, "Logic Inputs" is set to 1 and "Logic Outputs" is set to 1. At the bottom are "OK" and "Cancel" buttons.

Create Custom Block Document opens a new DAP file, and a Create Custom DSP Block screen determines the quantities of audio and logic inputs/outputs necessary for the custom block. These quantities should match the combined totals from all components to be included in the custom block. Once quantities are selected, appropriate APT (Audio Pass-Through) and LPT (Logic Pass-Through) blocks are placed into the layout. The desired components are then placed within, and connected to, the APT and LPT blocks. Components may be added individually, or copied as a group from a separate DAP file.

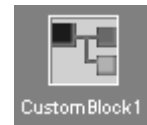
Certain components (such as Inputs/Outputs and Control Devices) cannot be placed within custom blocks. The number of components in a custom block is limited only by DSP resources available within a single hardware unit. Once the components are placed and connected, select Merge Into Custom Block from the menu.



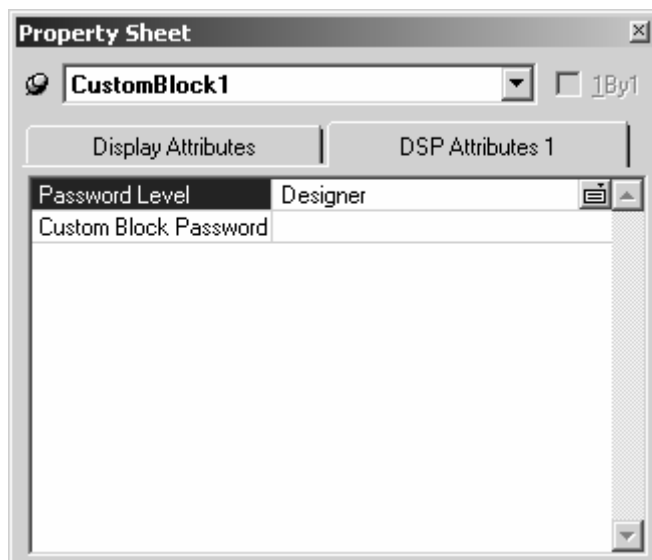
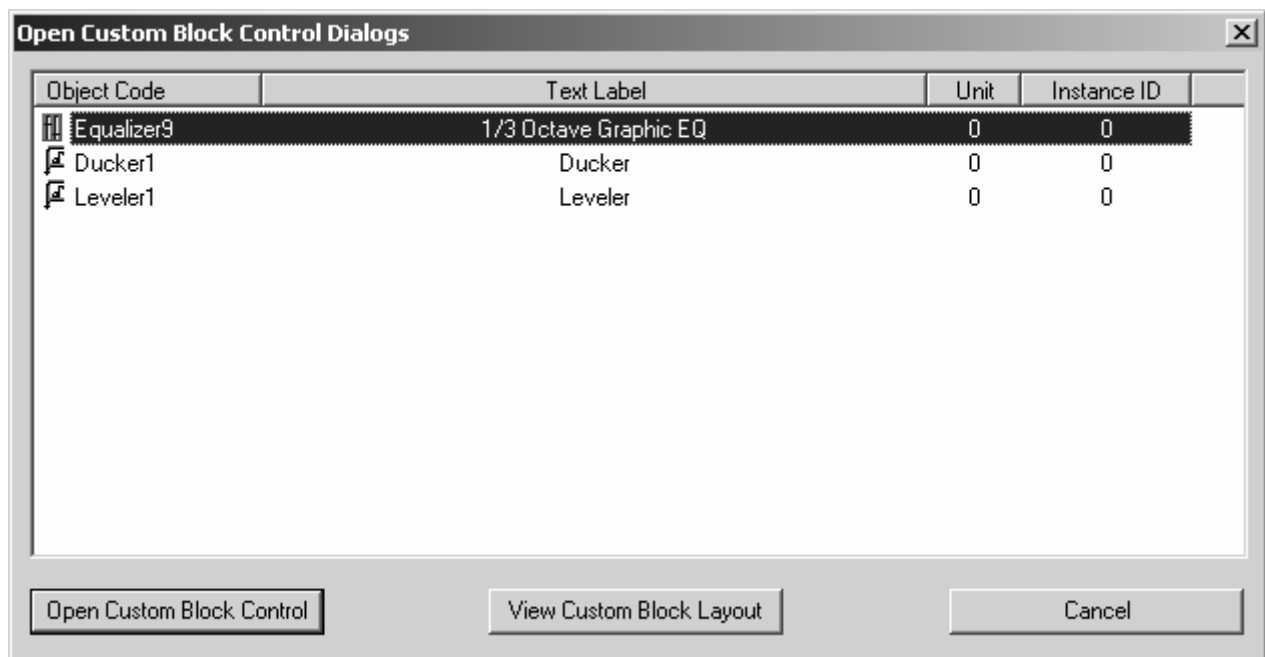
Merge Into Custom Block



Merge Into Custom Block checks for errors (such as inappropriate connections) as it packages the components into a single block. The resulting block can then be copied into the Equipment Room (and named) for use in future DAP design files. The Custom Block DAP file should also be saved as a reference for subsequent modifications.



Control settings for each component within a Custom Block can be adjusted (see Component Object Properties). Double-clicking a Custom Block in a design layout produces an Open Custom Block Control Dialogs screen. **Open Custom Block Control** provides direct access to the control dialogs for selected components. **View Custom Block Layout** displays the individual components within the Custom Block, which can then be accessed normally. Control Settings are saved as part of the Custom Block DAP file.

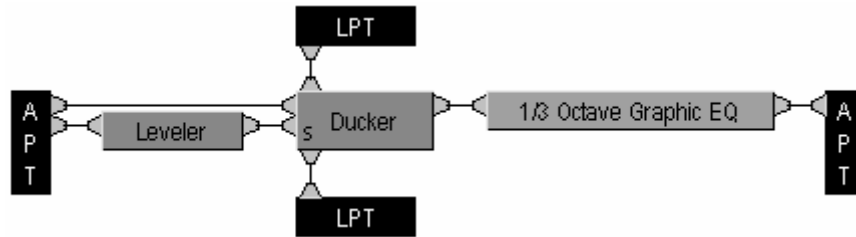


Control settings also remain part of any Custom Block which has been copied into the Equipment Room. These control settings may again be addressed once the Custom Block is placed into a new DAP design file. However, to prevent tampering with control settings, password protection may be added to a Custom Block via the Property Sheet. This option is available only while working in the Custom Block DAP file.

If components or connections within a merged Custom Block require modification, then select **Split Into Component Blocks** from the menu. Merge and Split operations are available only while working in the Custom Block DAP file.

Split Into Component Blocks

Split Into Component Blocks allows additional component and connection changes to be made to a Custom Block. Merge and Split operations are available only while working in the Custom Block DAP file.



Tools Menu

Passwords

Provides the Set Passwords dialog box, for establishing password protection in selected **E Desk™** devices. Set Password allows up to four levels of protection, each with a unique password (6~16 characters). **Designer** level allows access to system configuration, component settings, storing/recalling presets, and password assignments. **Technician** level limits access to component settings and storing/recalling presets. **User** level limits access to recalling presets only. However, Level Control and Meter dialog boxes can be minimized for User access (see Customizing Component Objects). **Guest** level limits access strictly to connection and viewing only.



NOTE: You must first Send Configuration to a device before a Password can be assigned. Passwords cannot be assigned to non-configured devices or design layouts.

Equipment Table

Provides an editable table of **E Desk™** devices in the system design. **Add** and **Remove** can be used to manually change the hardware design. However, Compile will add devices if needed (but will not automatically remove unnecessary devices). The Equipment Table may be used to aid system design, by initially specifying desired hardware configurations. Serial # and Device Description Label appear only when connected to a system, at which time the Equipment Table becomes 'read-only' information. **CN Latency** allows the selection of reduced delay times, which are supported on newer CobraNet firmware versions. The default CobraNet Latency for new DAP files is 5.33mS (see Compile Options). Alternate choices of 2.67mS and 1.33mS are available (see System Network Considerations). CN Latency affects the creation of new DAP files, as well as the modification and recompilation of existing files/systems.

Unit ID	Use	CobraNet	Model	Serial #	Device Description Label
1	☒	Yes	4040c	W0226651	Mark's WhirlWind Device

CN Latency: 51/3 ms

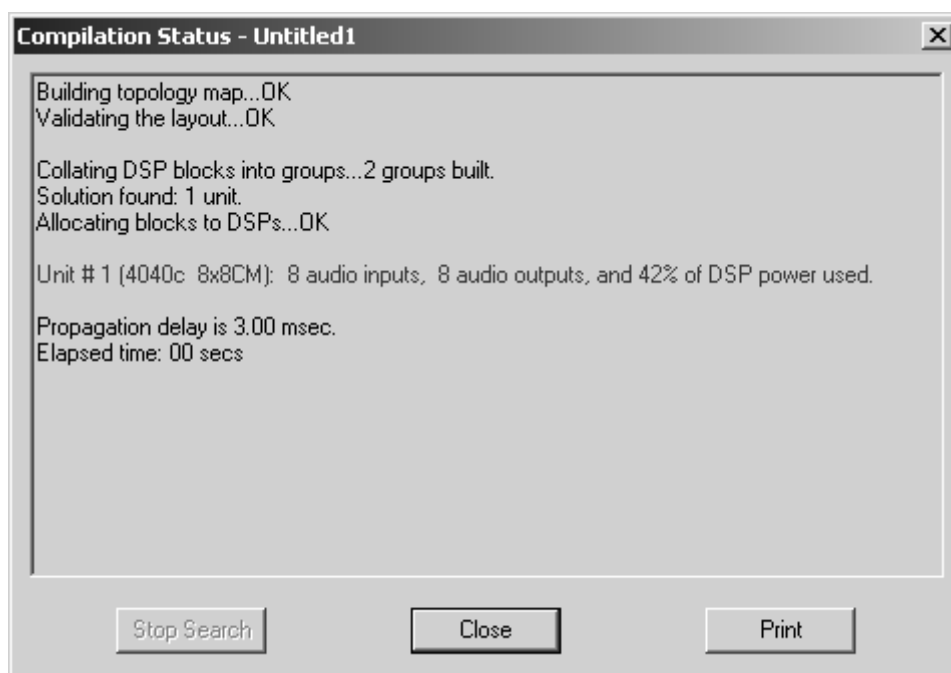
Add Remove OK Cancel

An **RCB** tab at the lower-left of the Equipment Table dialog box provides an editable table of devices connected to the Remote Control Bus of the E Desk devices in the system design. This table is used to establish proper association between external physical controls and their corresponding component counterparts in the layout. Each **DevID** (control component) should be matched to an appropriate **Serial #** (physical control). The DevID number can be found in the right corner of control component objects in the layout, when 'Display Device Assignment in DSP Block Info Field' is selected from Display Options. Serial # and Device Description information can be found for the physical controls using Device Maintenance.

DevID	Model	Serial #	Device Description Label
1	V8	X0100005	RC Test
2	VCB	X0400003	RC Test

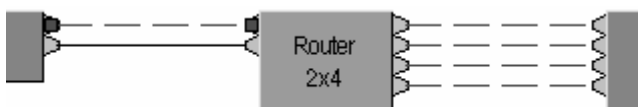
Layout Compile Results

Provides the most recent Compile results. This information may be viewed at any time.



Signal Path Identifier

Provides a temporary color-coded identification of all signal paths (Lines) which are associated with a selected Line Object. See example below, where the selected input is shown as being routed to four outputs. Signal Path Identifier is represented by a thin dashed red line. However, the Signal Path Identifier color may be changed in Display Options. When using Signal Path Identifier on a compiled design, propagation delay will appear in the Status Bar.



Options

Allows global options to be selected, which affect software behavior. An Options dialog box appears, with three tabs: General; Display; and Compile.

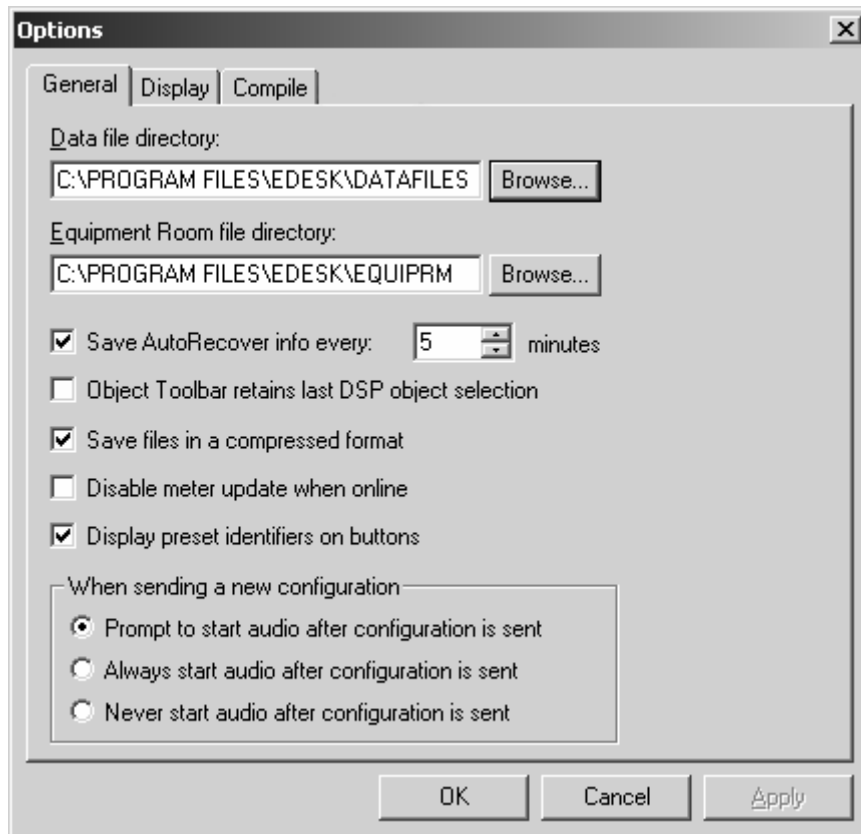
 see General Options

 see Display Options

 see Compile Options

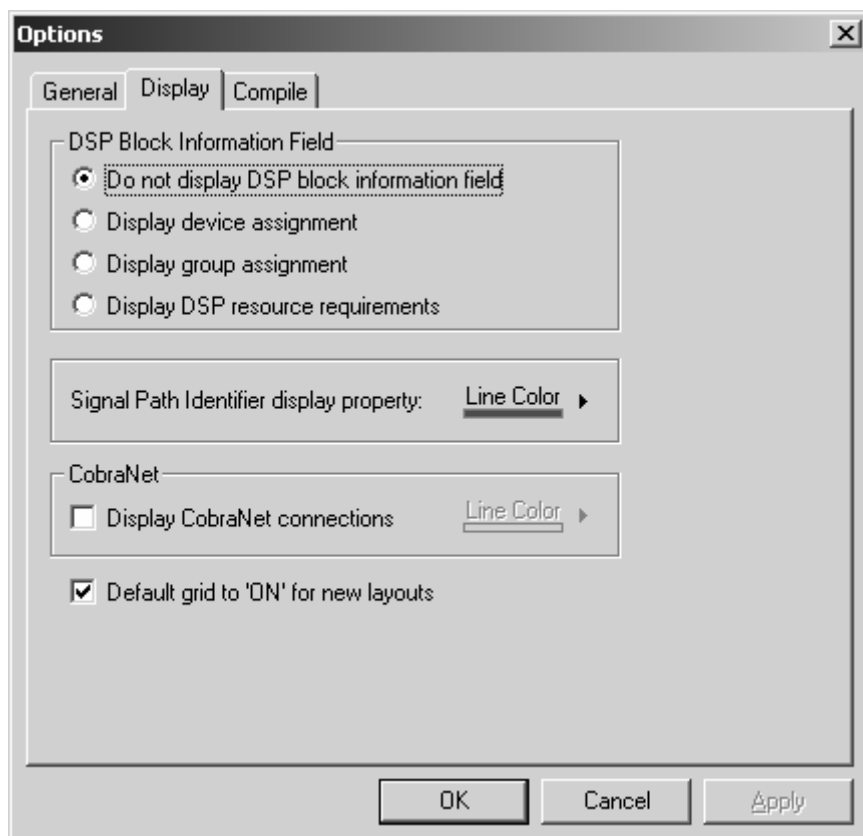
General Options

Allows Data Files (system designs) and Equipment Room (Component Objects) to be saved to specified directory locations. Allows Save AutoRecover time to be adjusted or disabled. Allows most recent Component Object selection to be retained, for repeated placement into Layout. Allows Compressed File Format to be disabled. Allows Meter activity to be disabled (locked), to reduce network data traffic. Allows Preset Buttons to display identifier numbers, or simply the word 'Recall'. Allows Start Audio to be prompted, automatic, or manual upon sending a new configuration.



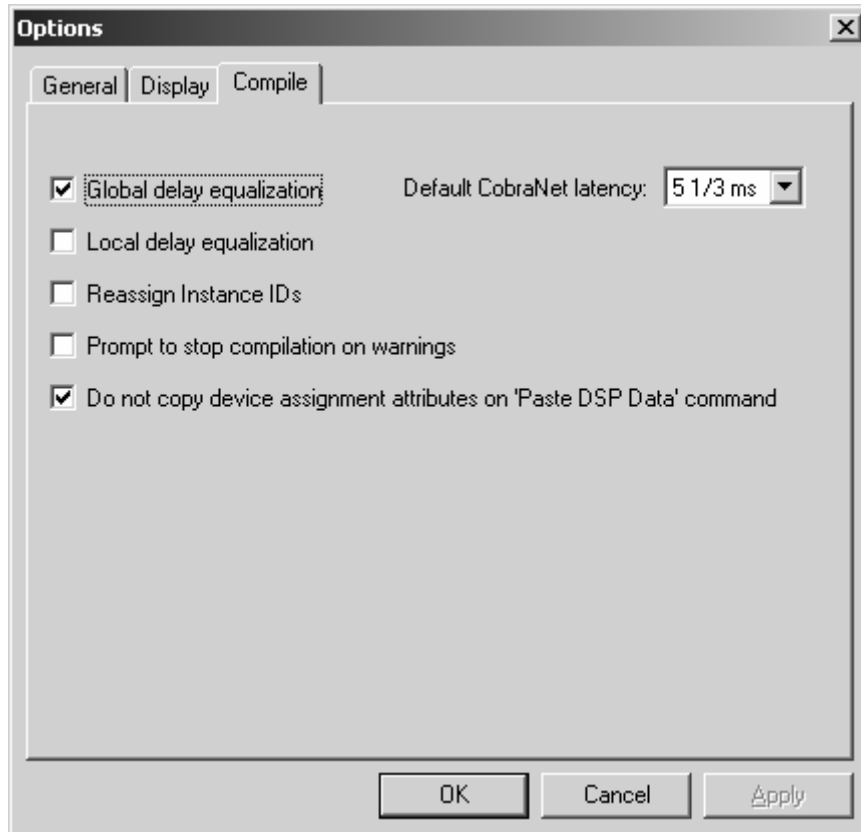
Display Options

Allows DSP Blocks (Component Objects) to display Device Assignment or Group Assignment numbers, as determined by Compile. (Device Assignments can be changed in the Property Sheet.) A third option is to display DSP Resource Requirements, which indicates the block's DSP usage as a percentage of total DSP resources available within a single hardware unit. Allows color of Signal Path Identifier to be changed. Allows CobraNet™ Connections to be displayed, and color to be changed (see System Network Considerations). Allows the default Grid to be applied when starting new design files.



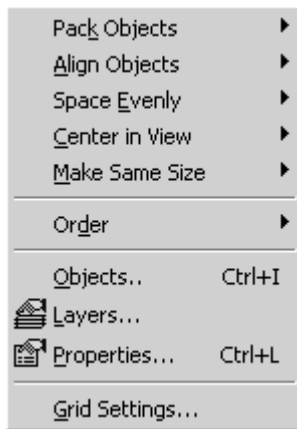
Compile Options

Allows Global Delay Equalization to be disabled system-wide (see System Compiling Considerations). Allows Local Delay Equalization to be enabled for I/O blocks which have Global Delay Equalization turned off (provides localized delay equalization for multi-input DSP blocks such as mixers). Allows automatic re-assignment of Instance IDs during Compile or Send Configuration. Allows Compile function to be stopped if warning occurs. Allows Device Assignments to be excluded from Paste DSP Data. Allows the Default CobraNet Latency for new files to be set for the Equipment Table.

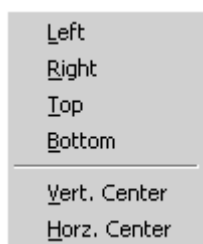


Layout Menu

Most Layout Menu items duplicate functions found in the Layout Toolbar. However, some exceptions are as follows:
Align Objects; Order; Objects; and Grid Settings.

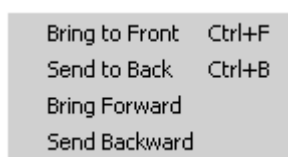


Align Objects



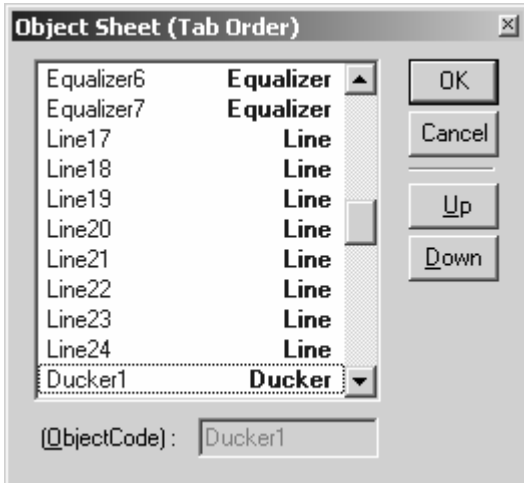
Align Objects provides Vertical Center & Horizontal Center functions, in addition to the Align Edges functions found on the Layout Toolbar.

Order



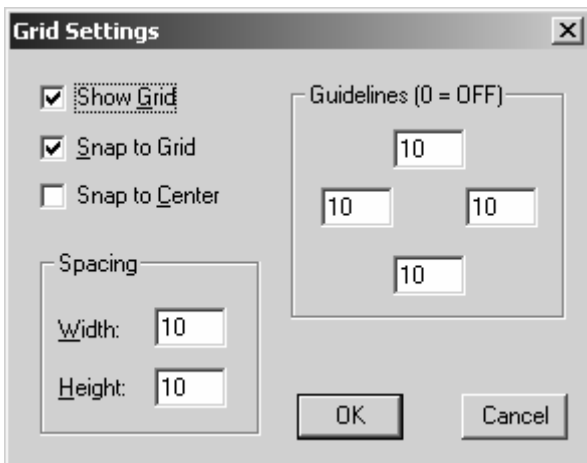
Order provides Bring Forward & Send Backward functions, in addition to the To Front Or Back functions found on the Layout Toolbar.

Object Sheet



Provides a list of all objects within the Layout. Normally, objects can be selected sequentially using the *Tab* key. The Object Sheet allows the order of this *Tab* selection to be changed. Objects may be selected directly from the list. When an object is selected, **Up** and **Down** change the Tab Order position of that object.

Grid Settings



Grid Settings allows the Layout Grid to be customized. **Show Grid** turns the Grid on/off. **Snap To Grid** forces the upper-left corner of objects to align with grid-marks. **Snap To Center** forces objects to center around grid-marks. **Spacing** determines the space between grid-marks (in pixels). **Guidelines** changes the location (in pixels) of the blue, dotted guidelines (initially found near the edges of the Layout).

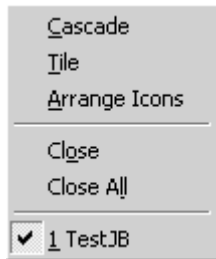
Window Menu

Multiple Layouts (system design files) may be open at the same time. Only one Layout will be active at a time (as indicated by the title bar).

Layouts can be arranged on the display using the Window Menu.

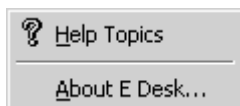
Cascade overlays the Layouts in an hierarchy. Tile fits the Layouts within the display. Close will close the active Layout. Close All will close all Layouts.

A list of open Layouts is provided for selection.



Help Menu

Provides **E Desk™** Help Topics and About **E Desk** information.



Status Bar



The Status Bar, along the bottom of the main screen, provides system information. The left side of the Status Bar (shown above) indicates system status, tool tips, or flash update information. The right side of the Status Bar (shown below) indicates system/network connection status (with progress bar), device DSP usage, total number of objects, number of objects selected, Layer status, object location, and object size.



Component Objects

Input Output



These Component Objects provide the audio inputs/outputs (I/O) to the system. Analog and CobraNet™ (digital) I/O are both available, allowing system designs to include A/D & D/A converters which have CobraNet capability. Input/Output components are available in pre-defined configurations, however, the configuration may be customized when being placed from the Object Toolbar.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.



see Input Control Dialog



see Output Control Dialog



see DCS88 Input Control Dialog



see DCS88 Output Control Dialog



see MLI Input Control Dialog



see MLO Output Control Dialog



see CobraNet Input Control Dialog

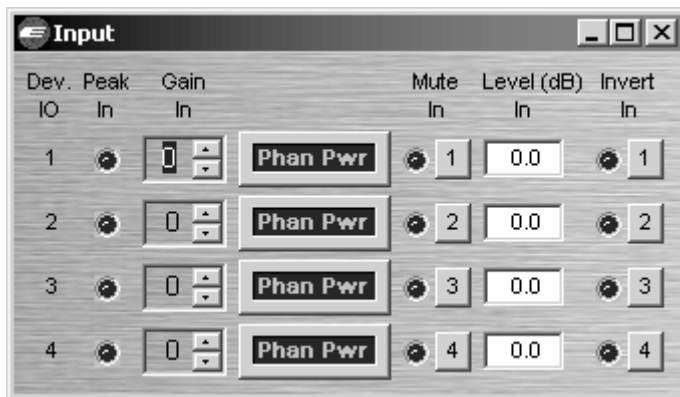


see CobraNet Output Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

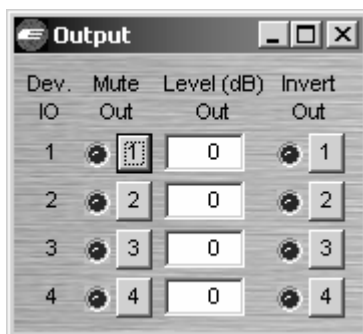
Input Control Dialog



Device IO indicates which hardware input is associated with that software channel. **Gain In** compensates for different input levels (mic or line), and should be set so **Peak In** flashes only occasionally (6dB headroom). **Phan Pwr** assigns +48 Volt phantom power to the input for condenser microphones. **Mute In** turns the input signal on/off. **Level In** adjusts the relative input volume. **Invert In** reverses the polarity of the input signal.

Right-clicking over certain settings will provide a menu of additional options.

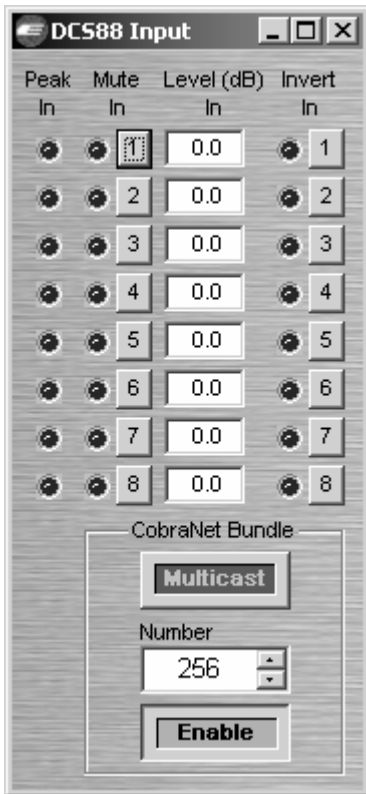
Output Control Dialog



Device IO indicates which hardware output is associated with that software channel. **Mute Out** turns the output signal on/off. **Level Out** adjusts the relative output volume. **Invert Out** reverses the polarity of the output signal.

Right-clicking over certain settings will provide a menu of additional options.

DCS88 Input Control Dialog



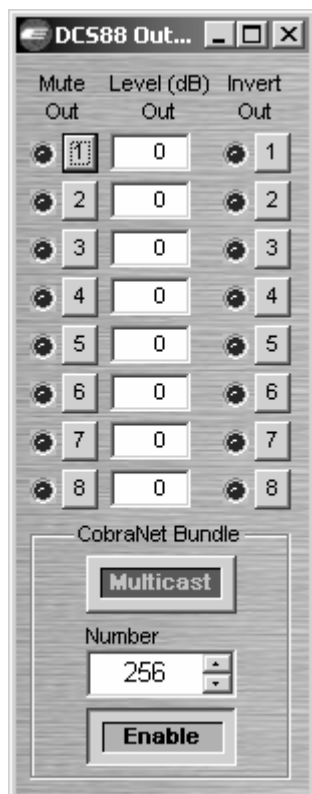
DCS88 Input blocks are similar to CobraNet Input blocks, except they are designed for use with DCS88 hardware specifically and, therefore, automatically allow for Internal Propagation Delay. CobraNet Input blocks may be used with DCS88 hardware, but Internal Propagation Delay must be manually set (1.00mS).

Adjust DCS88 input trim (gain) controls so that **Peak In** flashes only occasionally (6dB headroom). **Mute In** turns the input signal on/off. **Level In** adjusts the relative input volume. **Invert In** reverses the polarity of the input signal.

CobraNet Bundle assigns digital audio data to a particular bundle number. CobraNet Bundle Numbers are used to match those of the actual DCS88 hardware being used in the system. Normally, 'unicast' bundles 256 ~ 61,439 are selectable. These are device specific bundles (for exchange of digital audio with only one other device). **Multicast** allows selection of bundles 1 ~ 255, which are not device specific (for exchange of digital audio with multiple devices). **Enable** turns on/off the exchange of CobraNet digital audio data from this device.

Right-clicking over certain settings will provide a menu of additional options.

DCS88 Output Control Dialog



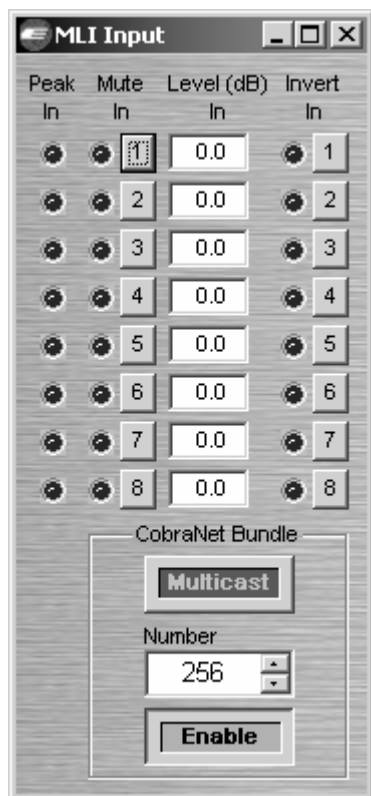
DCS88 Output blocks are similar to CobraNet Output blocks, except they are designed for use with DCS88 hardware specifically and, therefore, automatically allow for Internal Propagation Delay. CobraNet Output blocks may be used with DCS88 hardware, but Internal Propagation Delay must be manually set (0.33mS).

Mute Out turns the output signal on/off. **Level Out** adjusts the relative output volume. **Invert Out** reverses the polarity of the output signal.

CobraNet Bundle assigns digital audio data to a particular bundle. CobraNet Bundle Numbers are used to match those of the actual DCS88 hardware being used in the system. Normally, 'unicast' bundles 256 ~ 61,439 are selectable. These are device specific bundles (for exchange of digital audio with only one other device). **Multicast** allows selection of bundles 1 ~ 255, which are not device specific (for exchange of digital audio with multiple devices). **Enable** turns on/off the exchange of CobraNet digital audio data from this device.

Right-clicking over certain settings will provide a menu of additional options.

MLI Input Control Dialog



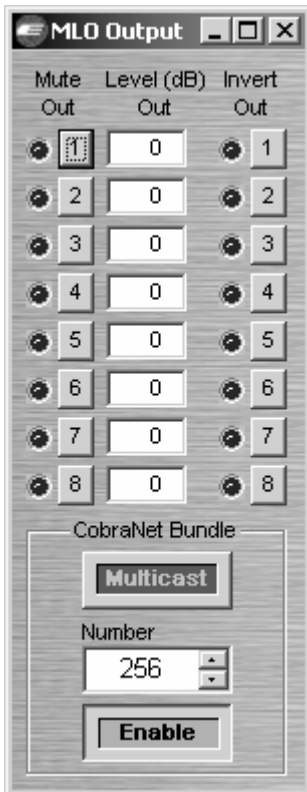
MLI (Mic/Line Input) blocks are similar to CobraNet Input blocks, except they are designed for use with E Snake hardware specifically and, therefore, automatically allow for Internal Propagation Delay. CobraNet Input blocks may be used with E Snake hardware, but Internal Propagation Delay must be manually set (1.67mS).

Adjust MLI input trim (gain) controls so that **Peak In** flashes only occasionally (6dB headroom). **Mute In** turns the input signal on/off. **Level In** adjusts the relative input volume. **Invert In** reverses the polarity of the input signal.

CobraNet Bundle assigns digital audio data to a particular bundle number. CobraNet Bundle Numbers are used to match those of the actual DCS88 hardware being used in the system. Normally, 'unicast' bundles 256 ~ 61,439 are selectable. These are device specific bundles (for exchange of digital audio with only one other device). **Multicast** allows selection of bundles 1 ~ 255, which are not device specific (for exchange of digital audio with multiple devices). **Enable** turns on/off the exchange of CobraNet digital audio data from this device.

Right-clicking over certain settings will provide a menu of additional options.

MLO Output Control Dialog



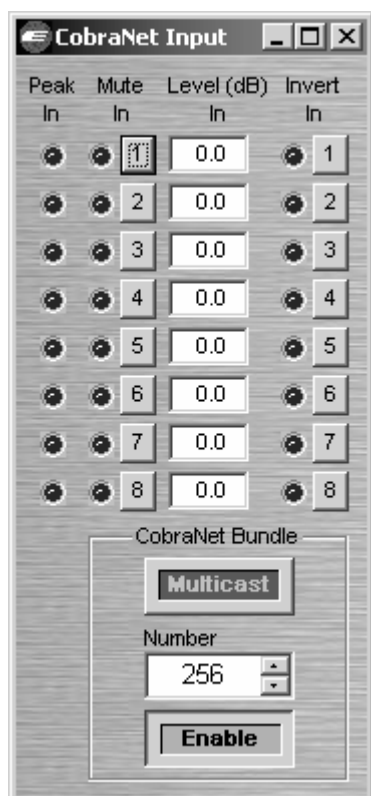
MLO (Mic/Line Output) blocks are similar to CobraNet Output blocks, except they are designed for use with E Snake hardware specifically and, therefore, automatically allow for Internal Propagation Delay. CobraNet Output blocks may be used with E Snake hardware, but Internal Propagation Delay must be manually set (0.67mS).

Mute Out turns the output signal on/off. **Level Out** adjusts the relative output volume. **Invert Out** reverses the polarity of the output signal.

CobraNet Bundle assigns digital audio data to a particular bundle. CobraNet Bundle Numbers are used to match those of the actual DCS88 hardware being used in the system. Normally, 'unicast' bundles 256 ~ 61,439 are selectable. These are device specific bundles (for exchange of digital audio with only one other device). **Multicast** allows selection of bundles 1 ~ 255, which are not device specific (for exchange of digital audio with multiple devices). **Enable** turns on/off the exchange of CobraNet digital audio data from this device.

Right-clicking over certain settings will provide a menu of additional options.

CobraNet Input Control Dialog



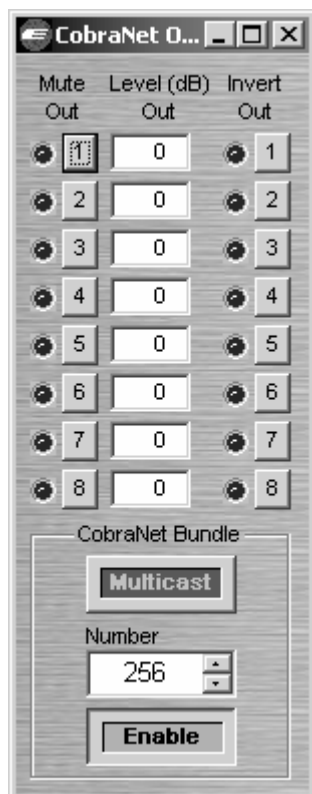
Adjust external signal source so **Peak In** flashes only occasionally (6dB headroom). **Mute In** turns the input signal on/off. **Level In** adjusts the relative input volume. **Invert In** reverses the polarity of the input signal.

CobraNet Bundle assigns digital audio data to a particular bundle number. CobraNet Bundle Numbers are used to match those of any external third-party CobraNet A/D converters being used in the system (see DCS88 and E Snake). Normally, 'unicast' bundles 256 ~ 61,439 are selectable. These are device specific bundles (for exchange of digital audio with only one other device). **Multicast** allows selection of bundles 1 ~ 255, which are not device specific (for exchange of digital audio with multiple devices). **Enable** turns on/off the exchange of CobraNet digital audio data from this device.

***Note:** CobraNet Input blocks now include an Internal Propagation Delay field to assist in delay equalization of audio signals going through third-party CobraNet output devices. The propagation delay through the E Desk system, the CobraNet transmission delay (according to the currently selected CobraNet Latency) and the internal propagation delay in the third-party equipment will be correctly taken into account. The "Default" setting for this field only takes into account the propagation delay through the E Desk system (0.67 ms).*

Right-clicking over certain settings will provide a menu of additional options.

CobraNet Output Control Dialog



Mute Out turns the output signal on/off. **Level Out** adjusts the relative output volume. **Invert Out** reverses the polarity of the output signal.

CobraNet Bundle assigns digital audio data to a particular bundle. CobraNet Bundle Numbers are used to match those of any external third-party CobraNet D/A converters being used in the system (see DCS88 and E Snake). Normally, 'unicast' bundles 256 ~ 61,439 are selectable. These are device specific bundles (for exchange of digital audio with only one other device). **Multicast** allows selection of bundles 1 ~ 255, which are not device specific (for exchange of digital audio with multiple devices). **Enable** turns on/off the exchange of CobraNet digital audio data from this device.

***Note:** CobraNet Output blocks now include an Internal Propagation Delay field to assist in delay equalization of audio signals going through third-party CobraNet input devices. The propagation delay through the E Desk system, the CobraNet transmission delay (according to the currently selected CobraNet Latency) and the internal propagation delay in the third-party equipment will be correctly taken into account. The "Default" setting for this field only takes into account the propagation delay through the E Desk system (0.67 ms).*

Right-clicking over certain settings will provide a menu of additional options.

Mixers



These Component Objects provide typical audio mixing functions, in five categories: Standard Mixers; Matrix Mixers; Auto Mixers; Mix-Minus Combiners; and Room Combiners. Mix-Minus Combiners are provided to enhance the capabilities of Auto Mixers in mix-minus and input expansion applications. Room Combiners are provided to enhance the capabilities of Auto Mixers in room combining and zone routing applications. Mixers are available in pre-defined configurations, however, the configuration may be customized when being placed from the Object Toolbar.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see Standard Mixers Control Dialog

 see Matrix Mixers Control Dialog

 see Auto Mixers Control Dialog

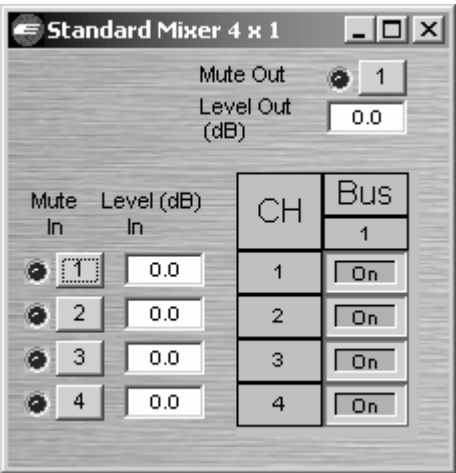
 see Mix-Minus Combiners Control Dialog

 see Room Combiners Control Dialog

Right-clicking over the object provides a pop-up menu of options. Control Dialog Boxes for Room Combiner components can be minimized to create user control surfaces (see Customizing Component Objects).

Control Dialog

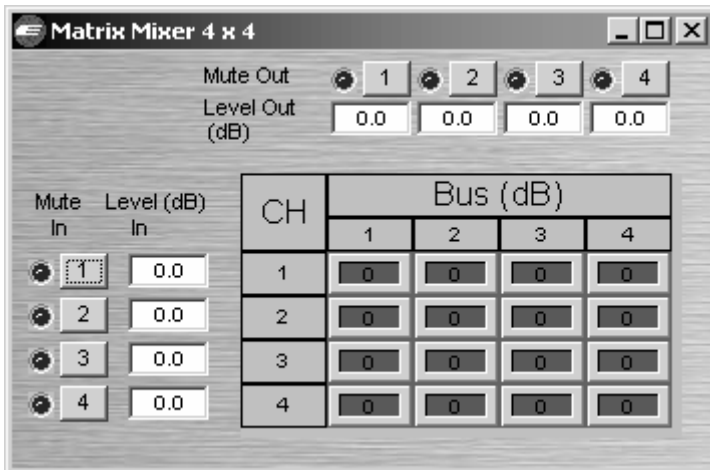
Standard Mixers Control Dialog



Mute In turns the input signal on/off. **Level In** adjusts the relative input volume. **Ch / Bus** assigns inputs to specific outputs. **Mute Out** turns the output signal on/off. **Level Out** adjusts the relative output volume.

Right-clicking over certain settings will provide a menu of additional options.

Matrix Mixers Control Dialog

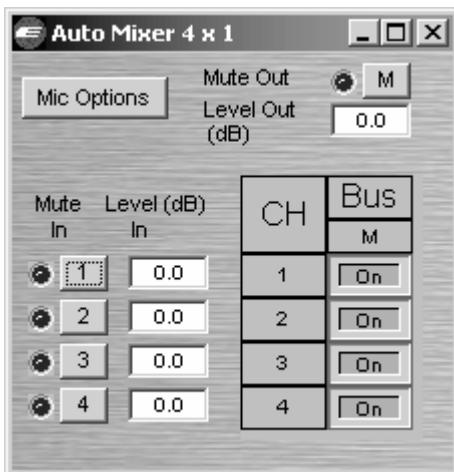


Mute In turns the input signal on/off. **Level In** adjusts the relative input volume. **Ch / Bus** assigns inputs to specific outputs, and right-clicking allows level adjustment. **Mute Out** turns the output signal on/off. **Level Out** adjusts the relative output volume.

Matrix Mixers w/Delay are also available. **Mix Table** assigns Ch / Bus to affect either level or delay settings.

Right-clicking over certain settings will provide a menu of additional options.

Auto Mixers Control Dialog



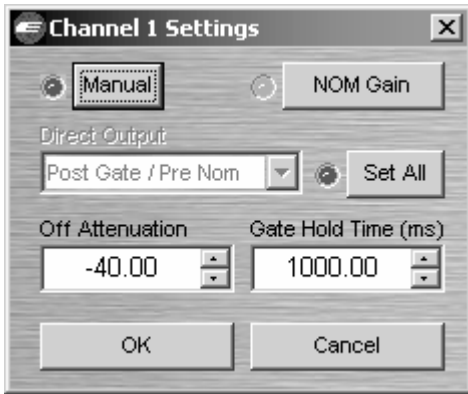
Mute In turns the input signal on/off. **Level In** adjusts the relative input volume. **Ch / Bus** assigns inputs to the output. **Mute Out** turns the output signal on/off. **Level Out** adjusts the relative output volume.

Mic Options opens a separate control dialog box to establish global settings.

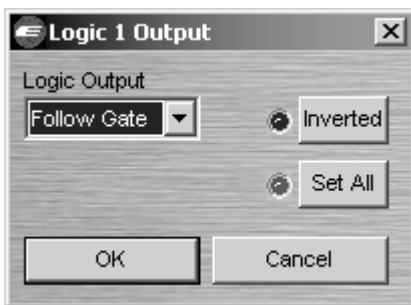


Designated Mic On / Last Mic Hold determines which microphone (if any) will stay/become active when no signal is present. **Logic Outputs Follow Mic Logic** assigns logic outputs to follow Designated Mic On / Last Mic Hold. **Open Mic Limits** enables (and designates) a maximum allowable number of active microphones.

Right-clicking over Ch / Bus assignments allows selection of two additional dialog boxes.



Channel Settings affects individual channel settings, but may be applied to all channels. **Manual** turns on/off channel gating. **NOM Gain** turns on/off channel contribution to NOM (number of open mics) attenuation. **Direct Output** designates channel direct output signal as Post Gate / Pre NOM, Post Gate / Post NOM, or Off. (Direct Outputs must be enabled when placing Auto Mixers from the Object Toolbar.) **Set All** causes current Channel Settings to be applied to all channels. **Off Attenuation** determines the amount of attenuation applied when channel is inactive. **Gate Hold Time** determines length of time before channel becomes inactive, once signal is no longer present.



Logic Outputs affects individual Logic Output settings, but may be applied to all Logic Outputs. (Logic Outputs must be designated when placing Auto Mixers from the Object Toolbar). **Logic Output** selects Follow Gate, On, or Off condition of the Logic Output. **Invert** reverses operation of the Logic Output (off when channel active). **Set All** causes current Logic Output settings to be applied to all channels.

Mix-Minus Combiners Control Dialog

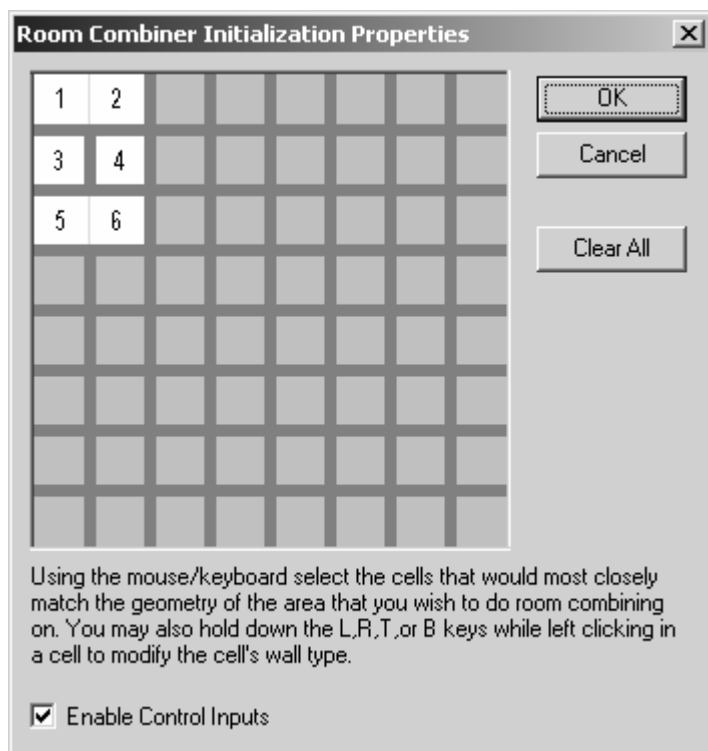


Mix-Minus Combiners are provided to enhance the capabilities of Auto Mixers in mix-minus and input expansion applications. Mix-Minus Combiners combine control data only and, therefore, have no audio outputs. Inputs to a Mix-Minus Combiner come from outputs of separate Auto Mixers. **Ch / Combine** allows input channels (1, 2, 3 etc.) to be grouped into specific combinations (A, B, C, etc.). These combinations automatically determine proper routing of control data for the Auto Mixers. Control data represents NOM (number of open mics) and ATS (adaptive threshold sensing) information. Mix-Minus Combiners are used when the Auto Mixer outputs are also connected to a separate Matrix Mixer (to create multiple 'mix-minus' outputs). Also, Mix-Minus Combiners allow large Auto Mixers to be created from multiple, smaller ones. This is useful when more than 32 inputs are required, or when an Auto Mixer must be placed into multiple E Desk units (for proper DSP allocation or for physical location of inputs).

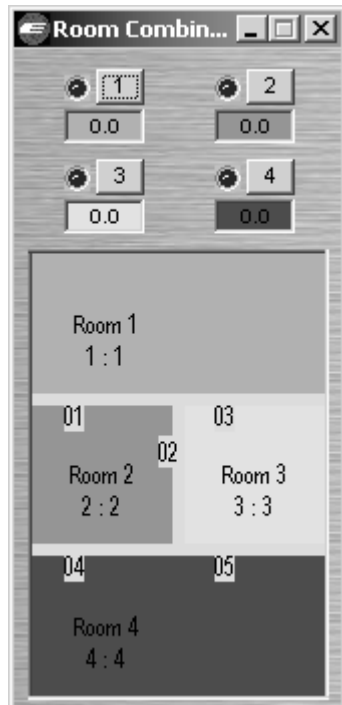
Right-clicking over certain settings will provide a menu of additional options.

Room Combiners Control Dialog

Room Combiners are provided to enhance the capabilities of Auto Mixers in room combining and zone routing applications. Room Combiners automatically determine proper routing of audio signals & control data for the Auto Mixers. Control data represents NOM (number of open mics) and ATS (adaptive threshold sensing) information. Room Combiners are available only from the Object Toolbar (not from the Equipment Room).



When a Room Combiner is placed, an Initialization Properties dialog box appears for creating physical relationships between rooms. The overall space is first defined by left-clicking multiple squares (non-contiguous rooms are allowed). Right-clicking then provides a menu of additional options, such as **Merge** adjacent squares into larger rooms, and **Isolate** rooms which have no moveable partitions. **Enable Control Inputs** provides the Room Combiner with control nodes, which allow combining via external devices (see Controls).



Once a Room Combiner is placed, the Control Dialog Box is available, which displays the overall space, including zones, partitions, levels, and mutes. Moveable partitions are numbered relative to control input nodes on the block. Combining may be accomplished 'automatically' by manipulation of these partitions. Moveable partitions can be opened/closed by means of external controls (see Controls & RS-232/Telnet). Combining can instead be accomplished by recalling stored preset configurations. Preset configurations must first be created, then recalled through either a Software User Interface or external controls (see Controls & RS-232/Telnet).

The Room Combiner dialog box allows rooms to be combined in groups, which are color-coded and numbered for identification. This can be used for real-time software control, or to generate various configurations to be stored as presets. Rooms can be grouped by manipulating partitions (using the mouse), or by selecting multiple rooms while holding *Shift* or *Ctrl*. This last approach allows non-contiguous and isolated rooms to be included in combined groups. Right-clicking on a room provides a menu of sixteen available groups. Level and mute adjustments become ganged for all rooms combined in the same group.

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Room Combiner components can be minimized to create user control surfaces (see Customizing Component Objects).

Equalizers



These Component Objects provide both graphic and parametric equalization, as well as feedback suppression. Equalizers may be connected between any components within the Layout, for applications which require room equalization, tone adjustment, or feedback control. Equalizers are available in pre-defined configurations, however, the configuration may be customized when being placed from the Object Toolbar.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

see Graphic Equalizer Control Dialog

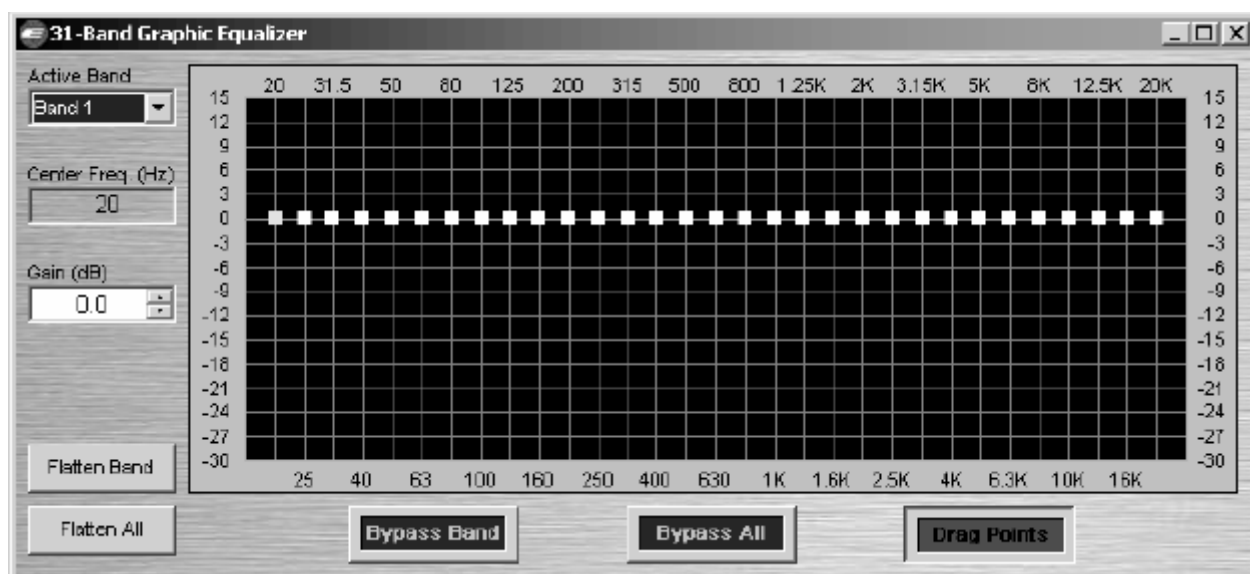
see Parametric Equalizer Control Dialog

see Feedback Suppressor Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

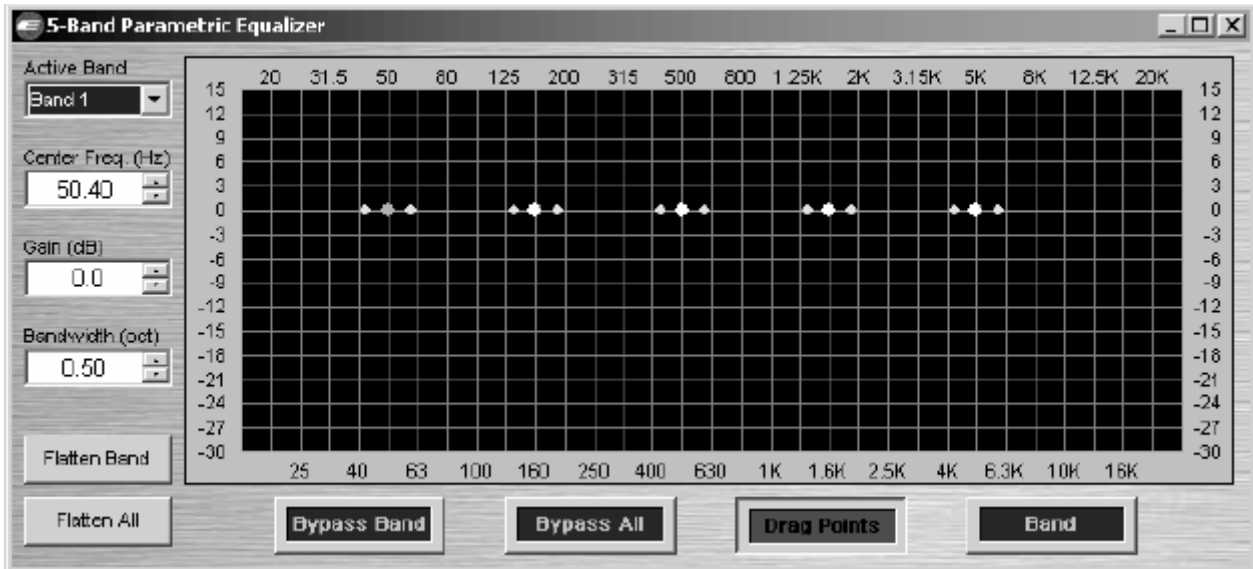
Graphic Equalizer Control Dialog



Active Band selects the current band to be adjusted. **Center Freq.** displays the center frequency for the current band. **Gain** adjusts the amount of cut or boost applied at the center frequency for the current band. Active Band and Gain may also be adjusted by dragging the band controls shown inside the graph. The selected band control becomes yellow, and dragging it up/down affects Gain for that band. **Flatten Band** & **Flatten All** change the band(s) Gain to '0' (flat). **Bypass Band** & **Bypass All** disable the band(s) without changing settings. **Drag Points** turns on/off the band controls, revealing the resultant curve only.

Right-clicking over certain settings will provide a menu of additional options.

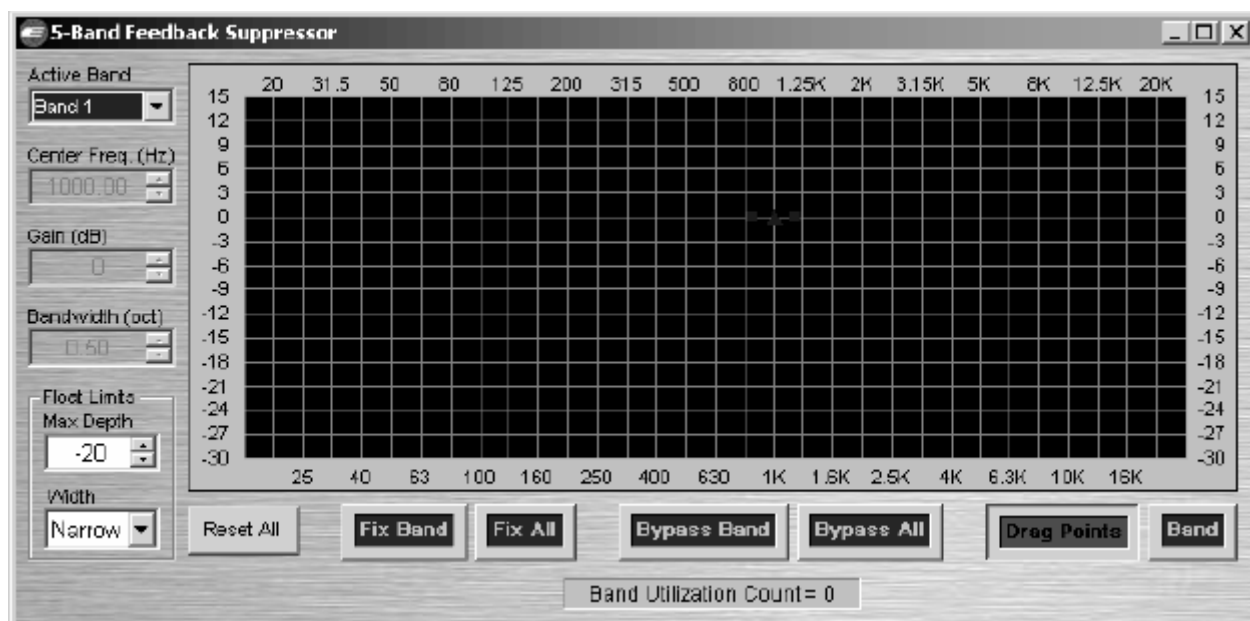
Parametric Equalizer Control Dialog



Active Band selects the current band to be adjusted. **Center Freq.** adjusts the center frequency for the current band. **Gain** adjusts the amount of cut or boost applied at the center frequency for the current band. **Bandwidth** adjusts the range of frequencies, above & below the center frequency, which are also affected by the current band. These settings may also be adjusted by dragging the band controls shown inside the graph. Dragging the white dot affects both Center Freq. & Gain. Dragging either yellow dot affects Bandwidth. **Flatten Band** & **Flatten All** change the band(s) Gain to '0' (flat). **Bypass Band** & **Bypass All** disable the band(s) without changing settings. **Drag Points** turns on/off the band controls, revealing the resultant curve only. **Band** highlights the current band inside the graph.

Right-clicking over certain settings will provide a menu of additional options.

Feedback Suppressor Control Dialog



Feedback Suppressors behave like automatic cut-only parametric equalizers. They utilize 'floating' bands of equalization which detect and remove feedback frequencies.

Active Band selects the current band for which settings will be displayed. **Center Freq.** displays the center frequency for the current band. **Gain** displays the amount of cut applied at the center frequency for the current band. **Bandwidth** displays the range of frequencies, above & below the center frequency, which are also affected by the current band. **Float Limits** restricts all floating bands to a selected maximum depth (cut) and bandwidth (Narrow = 1/40-octave; Wide = 1/10-octave). **Reset All** temporarily returns the gain of all floating bands to 0dB (flat). **Fix Band & Fix All** allow the band(s) to become manually adjustable (non-floating). **Bypass Band & Bypass All** disable the band(s) without changing settings. **Drag Points** turns on/off the band controls, revealing the resultant curve only. **Band** highlights the current band inside the graph. **Band Utilization Count** indicates the quantity of floating bands currently being employed.

NOTE: Feedback Suppressors are fairly intensive in their use of DSP resources. They are limited to a maximum of sixteen bands, however, in most applications the number of actual bands used should be significantly less. Fixed Bands in a Feedback Suppressor may be copied to a Parametric Equalizer. When applicable, this may be a more DSP efficient choice.

Right-clicking over certain settings will provide a menu of additional options.

Filters



These Component Objects provide High-Pass, Low-Pass, High-Shelf, Low-Shelf, & All-Pass filters. Filters may be connected between any components within the Layout, for applications which require 'roll-offs', simple tone controls, or even phase compensation.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see High Pass Filter Control Dialog

 see Low Pass Filter Control Dialog

 see High Shelf Filter Control Dialog

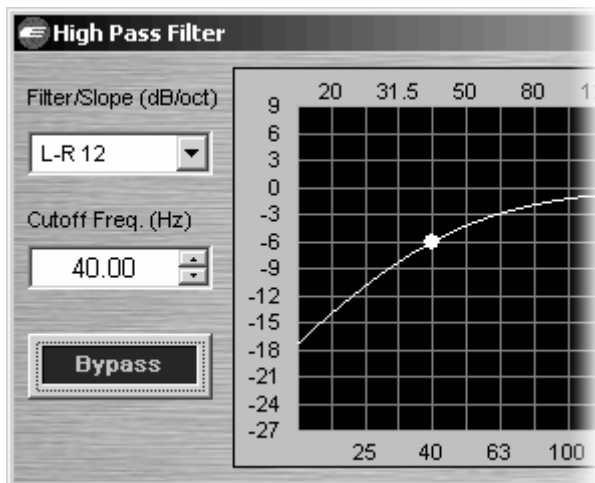
 see Low Shelf Filter Control Dialog

 see All-Pass Filter Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

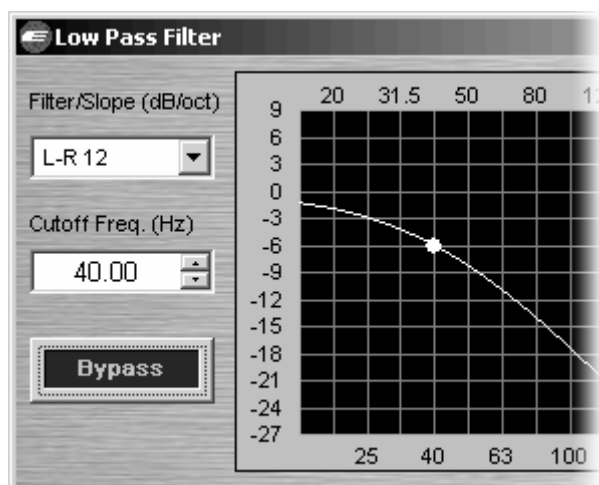
High Pass Filter Control Dialog



Filter / Slope selects the type (Linkwitz-Riley or Butterworth) and slope of the filter. **Cutoff Freq.** selects the cutoff frequency for the filter. Cutoff Freq. may also be adjusted by dragging the cursor shown inside the graph. **Bypass** disables the filter without changing settings.

Right-clicking over certain settings will provide a menu of additional options.

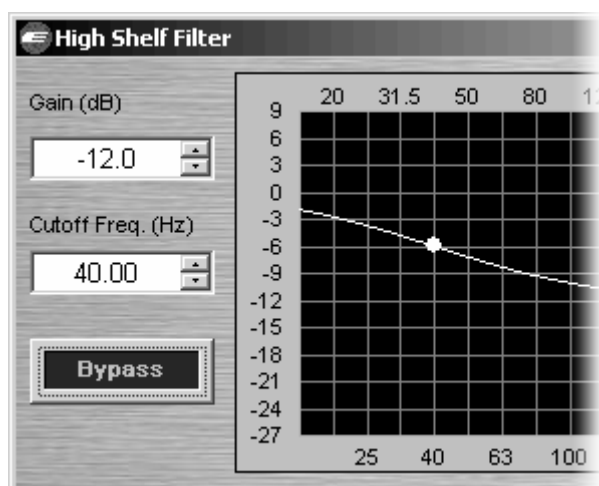
Low Pass Filter Control Dialog



Filter / Slope selects the type (Linkwitz-Riley or Butterworth) and slope of the filter. **Cutoff Freq.** selects the cutoff frequency for the filter. Cutoff Freq. may also be adjusted by dragging the cursor shown inside the graph. **Bypass** disables the filter without changing settings.

Right-clicking over certain settings will provide a menu of additional options.

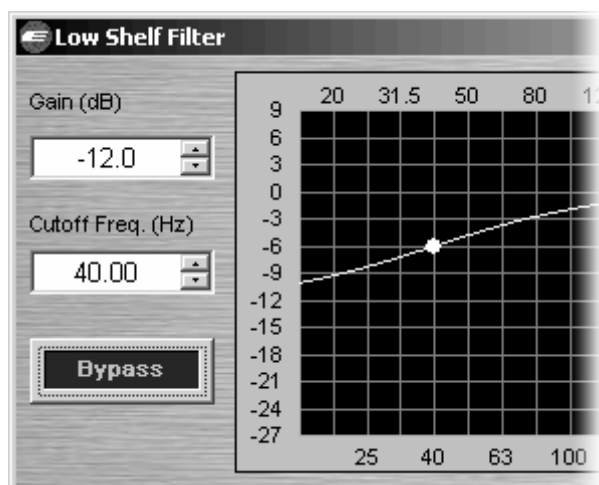
High Shelf Filter Control Dialog



Gain selects the amount of maximum cut or boost applied by the filter. **Cutoff Freq.** selects the cutoff frequency for the filter. These settings may also be adjusted by dragging the cursor shown inside the graph. **Bypass** disables the filter without changing settings.

Right-clicking over certain settings will provide a menu of additional options.

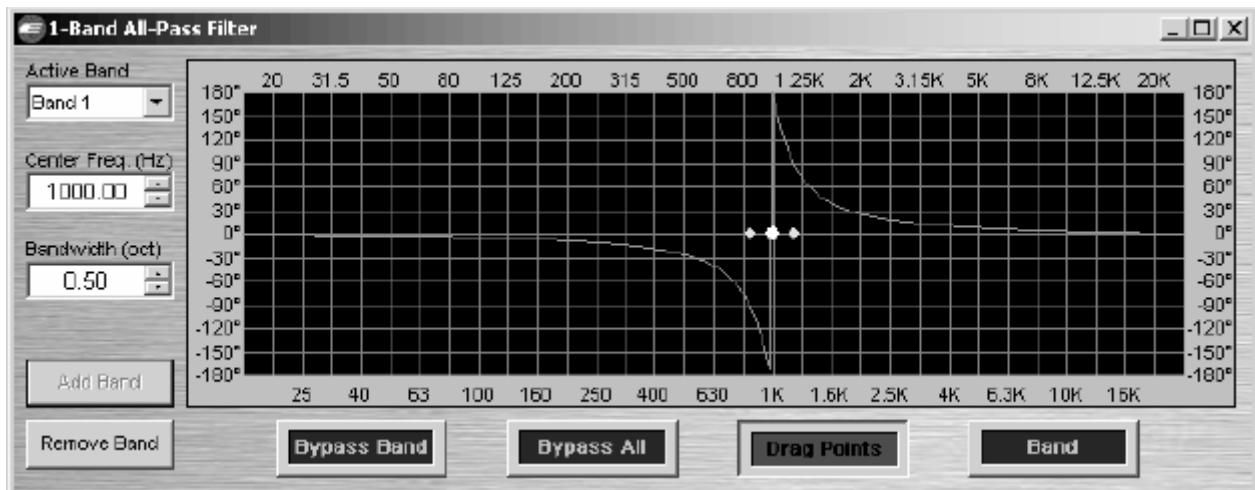
Low Shelf Filter Control Dialog



Gain selects the amount of maximum cut or boost applied by the filter. **Cutoff Freq.** selects the cutoff frequency for the filter. These settings may also be adjusted by dragging the cursor shown inside the graph. **Bypass** disables the filter without changing settings.

Right-clicking over certain settings will provide a menu of additional options.

All-Pass Filter



All-Pass Filters are so named because they do not affect frequency response. Instead, they affect signal phase only and, therefore, can be used to compensate for the phase anomalies caused by normal equalization filters. All-Pass Filters are available with up to sixteen bands.

Active Band selects the current band to be adjusted. **Center Freq.** adjusts the center frequency for the current band. **Bandwidth** adjusts the range of frequencies, above & below the center frequency, which are also affected by the current band. These settings may also be adjusted by dragging the band controls shown inside the graph. Dragging the white dot affects Center Freq. Dragging either yellow dot affects Bandwidth. **Add Band** & **Remove Band** work within the designated number of bands for the filter. **Bypass Band** & **Bypass All** disable the band(s) without changing settings. **Drag Points** turns on/off the band controls, revealing the resultant curve only. **Band** highlights the phase response of the current band inside the graph.

See Transfer Function as an effective diagnostic tool to be used in conjunction with All-Pass Filters.

Right-clicking over certain settings will provide a menu of additional options.

Crossovers



These Component Objects provide 2-way, 3-way, & 4-way crossover functions. Crossovers may be connected between any components within the Layout, for applications which require multiple outputs with specified frequency ranges.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see 2-Way Crossover Control Dialog

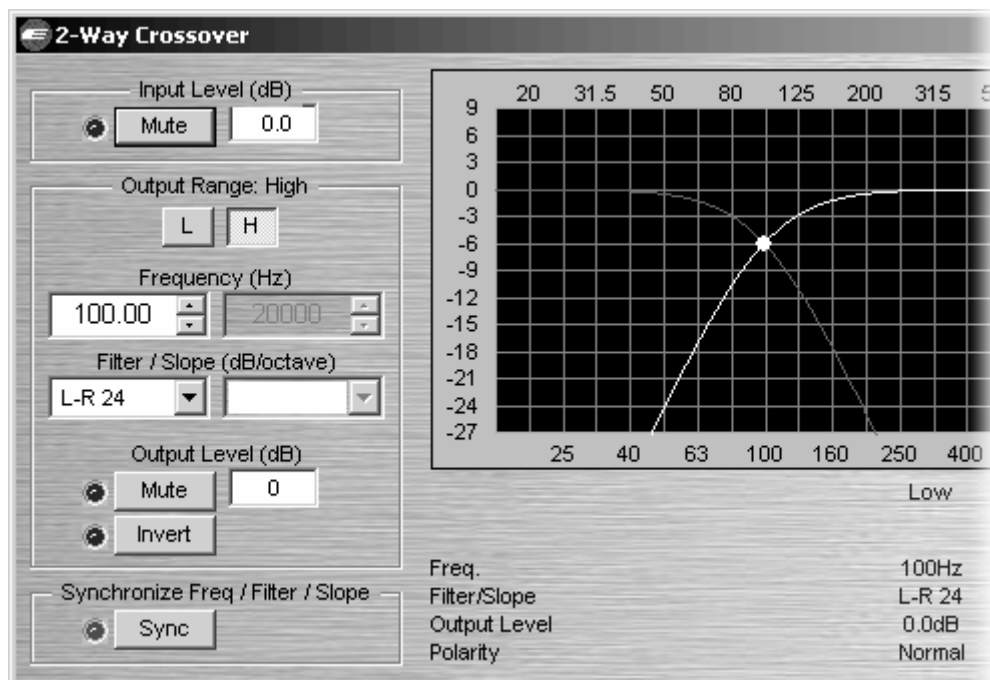
 see 3-Way Crossover Control Dialog

 see 4-Way Crossover Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

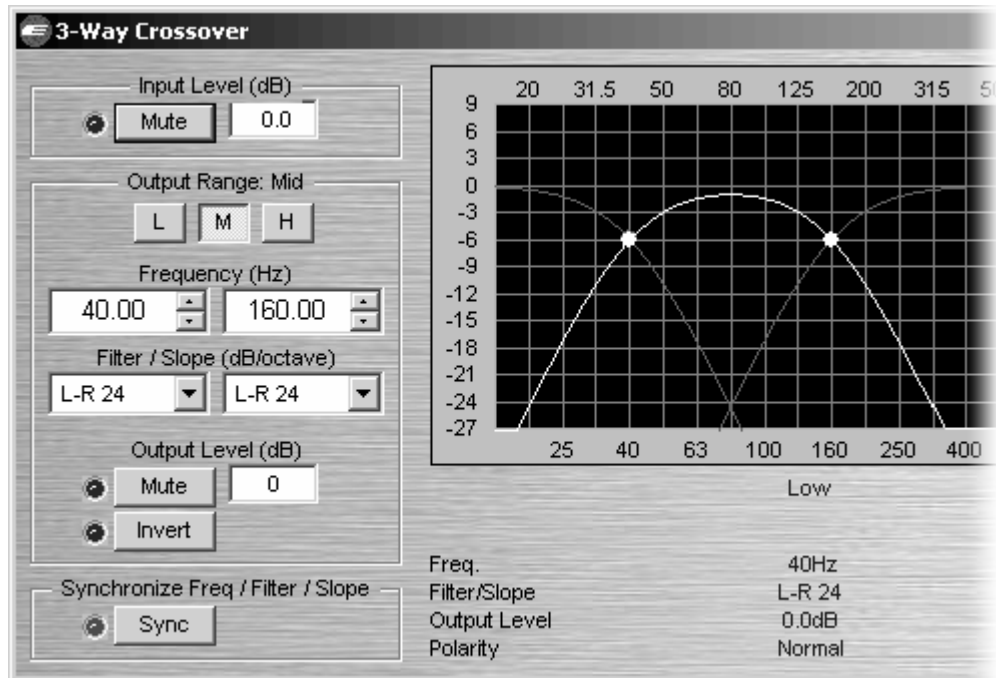
2-Way Crossover Control Dialog



Input Level provides muting and level adjustment for the input. **Output Range** selects the Low or High frequency output. **Frequency** selects the filter cutoff frequency for the selected output. Output Range & Frequency may also be selected by dragging the cursors shown inside the graph. **Filter / Slope** selects the type (Linkwitz-Riley or Butterworth) and slope of filter used at the associated Frequency. **Output Level** provides muting, level adjustment, & polarity reversal for the selected output. **Sync** forces filter adjustments on adjacent outputs to be linked. Settings for each output are displayed across the bottom of the dialog box.

Right-clicking over certain settings will provide a menu of additional options.

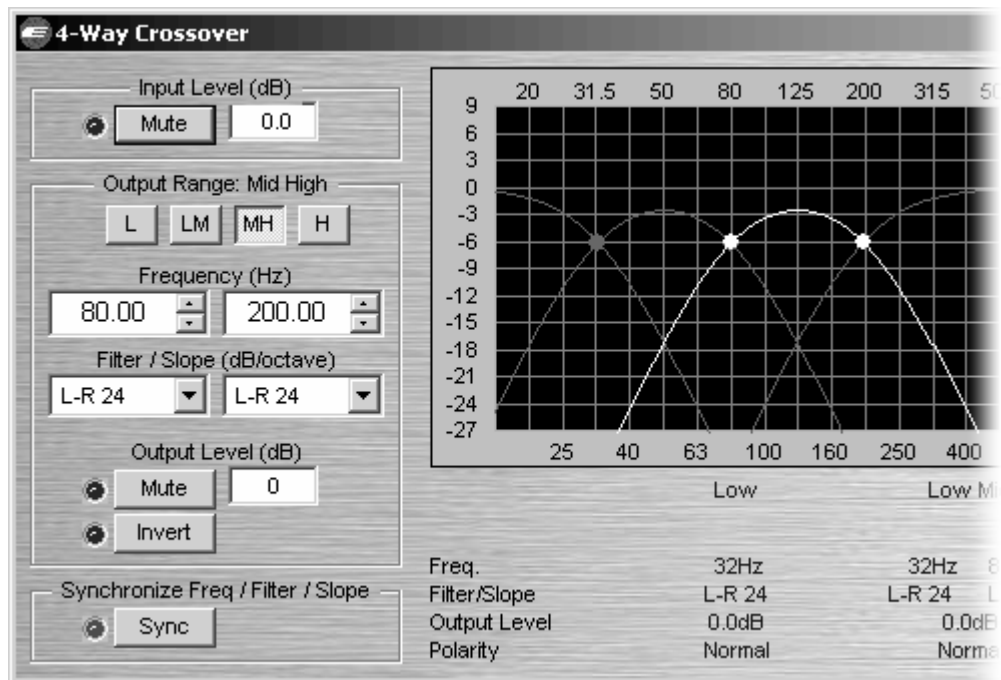
3-Way Crossover Control Dialog



Input Level provides muting and level adjustment for the input. **Output Range** selects the Low, Mid, or High frequency output. **Frequency** selects the filter cutoff frequencies for the selected output. Output Range & Frequency may also be selected by dragging the cursors shown inside the graph. **Filter / Slope** selects the type (Linkwitz-Riley or Butterworth) and slope of filter used at the associated Frequency. **Output Level** provides muting, level adjustment, & polarity reversal for the selected output. **Sync** forces filter adjustments on adjacent outputs to be linked. Settings for each output are displayed across the bottom of the dialog box.

Right-clicking over certain settings will provide a menu of additional options.

4-Way Crossover Control Dialog



Input Level provides muting and level adjustment for the input. **Output Range** selects the Low, Low-Mid, Mid-High, or High frequency output. **Frequency** selects the filter cutoff frequencies for the selected output. Output Range & Frequency may also be selected by dragging the cursors shown inside the graph. **Filter / Slope** selects the type (Linkwitz-Riley or Butterworth) and slope of filter used at the associated Frequency. **Output Level** provides muting, level adjustment, & polarity reversal for the selected output. **Sync** forces filter adjustments on adjacent outputs to be linked. Settings for each output are displayed across the bottom of the dialog box.

Right-clicking over certain settings will provide a menu of additional options.

Dynamics



These Component Objects provide Leveler, Comp/Limiter, Ducker, Noise Gate, & Ambient Noise Compensator functions. Dynamics components may be connected between any other components within the Layout, for applications which require automatic control of volume levels and/or dynamics.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see Leveler Control Dialog

 see Comp/Limiter Control Dialog

 see Ducker Control Dialog

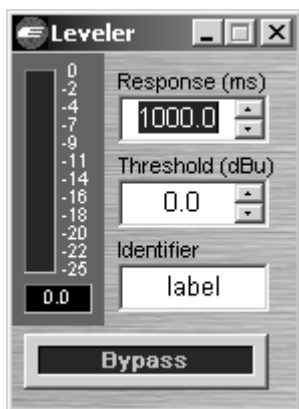
 see Noise Gate Control Dialog

 see Ambient Noise Compensator Control Dialog

Right-clicking over the object provides a pop-up menu of options. Control Dialog Boxes for some Dynamics components can be minimized to create user control surfaces (see Customizing Component Objects).

Control Dialog

Leveler Control Dialog



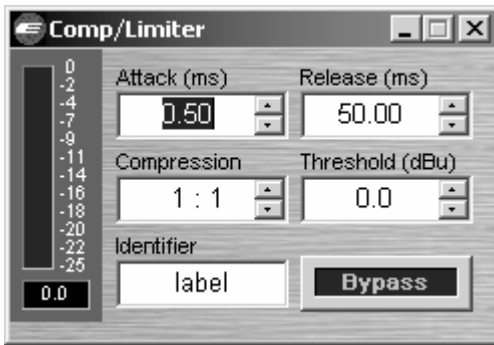
Levelers are automatic gain controls, which affect long-term average levels.

Response Time determines how quickly the Leveler reacts to input level changes.

Threshold determines what input level will trigger gain reduction. To maintain a consistent level, set Threshold to lowest desired level. A meter & numeric display indicate the amount of gain reduction. **Identifier** provides a custom label, when dialog box is minimized (see below). **Bypass** disables the Leveler without changing settings.

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Levelers can be minimized to create user control surfaces (see Customizing Component Objects).

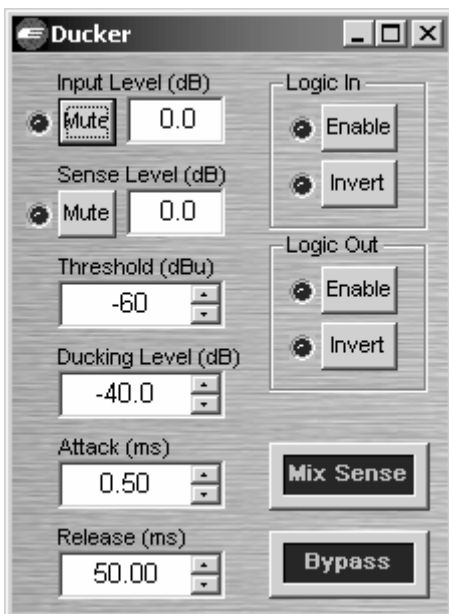
Comp/Limiter Control Dialog



Comp/Limiters affect short-term signal dynamics (peaks). **Attack** determines how quickly the Comp/Limiter reacts to input level changes. **Compression Ratio** determines the intensity of gain reduction (input level increase vs. output level increase). **Release Time** determines how quickly gain reduction is released, once input signal falls below Threshold. **Threshold** determines what input level will trigger gain reduction. A meter & numeric display indicate the amount of gain reduction. **Bypass** disables the Comp/Limiter without changing settings. **Identifier** provides a custom label, when dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Comp/Limiters can be minimized to create user control surfaces (see Customizing Component Objects).

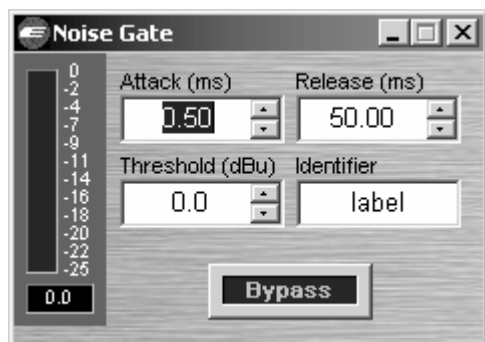
Ducker Control Dialog



Duckers provide level attenuation, triggered by signal or logic inputs. **Input Level** provides muting and level adjustment for the normal audio input, which appears as the upper input on the left side of the Ducker. **Sense Level** provides muting and level adjustment for the signal trigger input, which appears as the lower input on the left side of the Ducker. **Threshold** determines what sense input signal level will trigger ducking. **Ducking Level** determines how much attenuation is applied to the normal audio signal during ducking. **Attack** determines how quickly the ducker reacts to trigger input (signal or logic). **Release** determines how quickly attenuation is released, once trigger input is removed (signal or logic). **Logic In** turns on/off and reverses operation (off triggers ducking) of the logic trigger input, which appears at the top of the Ducker. **Logic Out** provides the same functions as Logic In, but instead as a trigger output (follows ducking activity), which appears at the bottom of the Ducker. **Mix Sense** allows the Sense input signal to be mixed with normal audio input signal, at the output of the Ducker. **Bypass** disables the Ducker without changing settings.

Right-clicking over certain settings will provide a menu of additional options.

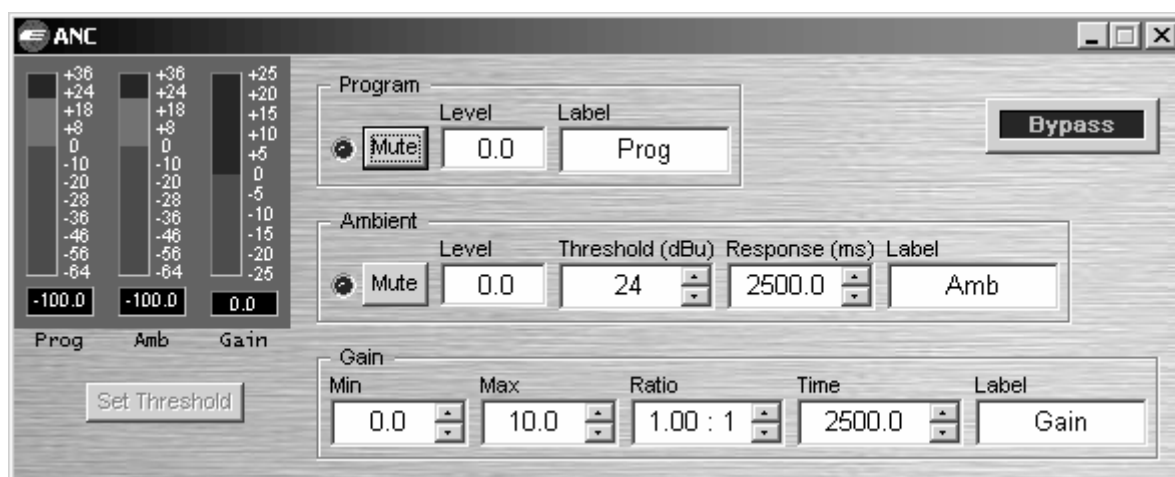
Noise Gate Control Dialog



Noise Gates provide automatic muting, until triggered by signal presence. **Attack Time** determines how quickly the gate opens when signal is present. **Release Time** determines how quickly the gate closes when signal is no longer present. **Threshold** determines what input signal level will trigger the gate to open. A meter & numeric display indicate the amount of gain reduction. **Identifier** provides a custom label, when dialog box is minimized (see below). **Bypass** disables the Noise Gate without changing settings.

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Noise Gates can be minimized to create user control surfaces (see Customizing Component Objects).

Ambient Noise Compensator



Ambient Noise Compensators automatically adjust program volume in response to changes in background noise levels, as monitored by external ambient sensing microphone(s).

Program Mute turns the program input signal on/off. **Program Level** adjusts the relative program input volume. **Program Label** provides a custom label, when the dialog box is minimized (see below). **Prog Meter** displays the current program input level.

Ambient Mute turns the ambient input signal on/off. **Ambient Level** adjusts the relative ambient input volume. **Ambient Threshold** determines the ambient noise level at which program gain increases will begin. **Ambient Response** sets the period of time to be considered when calculating an average of ambient level changes. **Ambient Label** provides a custom label, when the dialog box is minimized (see below). **Amb Meter** displays the current ambient input level. The **Set Threshold** button can be used to estimate an appropriate Ambient Threshold setting.

Gain Min sets the minimum output gain (for periods of low ambient noise). **Gain Max** sets the maximum output gain (for periods of high ambient noise). **Gain Ratio** determines how much the program volume will increase, relative to a given increase in ambient noise. **Gain Time** establishes how quickly program gain changes are applied. Gain Time indicates the amount of time required for a gain change between Min and Max settings. Lesser gain changes will occur more rapidly. **Gain Meter** displays the current gain compensation being applied.

Bypass disables the Ambient Noise Compensator without changing settings.

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Ambient Noise Compensators can be minimized to create user control surfaces (see Customizing Component Objects).

 see Ambient Noise Compensator setup procedure.

ANC Setup Procedure

Connections

- Feed the "program" signal into the Program Input (top left) of the ANC block. Setup of the ANC block is best done with a relatively constant program source. This can be the actual program source or a pink noise approximation, but its level should represent the highest program material level you expect will be fed to the ANC block.
- Feed the "ambient" signal into the Ambient Input (bottom left, marked with an "A") of the ANC block. This signal should be derived from either a single dedicated sensing microphone, or from a dedicated array of sensing microphones feeding a common Mixer block. Setup of the ANC block is best done when the ambient noise in the room(s) is minimal, but the Ambient Meter should read *at least* -60dBu.
- Connect the output of the ANC block to its destination. Keep in mind that the ANC should be the last block in the program signal path, with no form of level control provided at the outputs, amplifiers, or speakers.

Setting Min and Max Gain

- Adjust the Min Gain and Max Gain settings for the desired amounts of minimum and maximum gain to be applied to the program signal. Remember that Min Gain is the constant gain that the ANC block will apply while the Ambient Input signal level is below the Ambient Threshold. Remember that Max Gain is the maximum amount of gain that the ANC block will ever apply to the program input.

If Min Gain and Max Gain are not known, these settings may be determined by listening to the ANC output, as follows:

- Set the Ambient Threshold to its maximum setting (+24dBu) to ensure the Ambient Input level is below threshold. This ramps the ANC to the Min Gain setting. Keep in mind that the speed of this ramping is determined by the Gain Time setting.
- Adjust Min Gain until you have the desired minimum program level coming out of the ANC block. Note this value for later.
- Adjust Min Gain until you have the desired maximum program level coming out of the ANC block. Set Max Gain to this value. Set Min Gain to the value determined in the previous step.

Setting Response Times

- Adjust the Gain Time to determine how quickly the ANC gain changes. Gain Time is the amount of time it takes for the ANC block to ramp from Gain Min to Gain Max, or vice versa.
- Adjust the Ambient Response time to determine how quickly the Ambient Input detector responds to changes in the Ambient Input signal. Ambient Response should be set fast enough to track important ambient level changes (e.g. an approaching train in a depot), but slow enough to ignore unimportant ambient level changes (e.g. someone popping their bubble gum).

Note: The overall responsiveness of the ANC output is determined by the larger (slower) of the two aforementioned times: Gain Time and Ambient Response time.

Setting Thresholds

- Press the "Set Threshold" button, ensuring that the Program Input level is a good approximation of the highest program signal level you expect will be fed to the ANC. This process records the levels of both the Ambient and Program inputs. The Ambient Threshold is set to 10dBu higher than the recorded Ambient level. This process takes up to 5 seconds.

Set Gain Ratio

- Adjust Gain Ratio to specify how many dB of gain is applied for every dBu over Ambient Threshold the Ambient level is.

Routers



These Component Objects provide typical audio routing functions. Routers may be connected between any components within the Layout, for applications which require routing of input signals to various outputs. Routers are available in pre-defined configurations, however, the configuration may be customized when being placed from the Object Toolbar.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

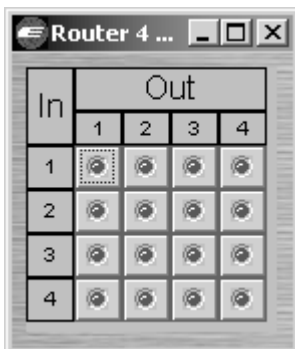


see Router Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

Router Control Dialog



Routers allow each input to be assigned to multiple outputs via **In / Out**. However, each output allows only one input assigned at a time. Therefore, Routers behave like a series of individual distribution amplifiers. For increased input/output assignment capability, see Mixers.

Right-clicking over certain settings will provide a menu of additional options.

Delays



These Component Objects provide typical audio time-delay functions. Delays may be connected between any components within the Layout, for applications which require room delay and/or loudspeaker time-alignment.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.



see Delay Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

Delay Control Dialog



Value determines the amount of delay, based on the selected Units. **Units** selects either time (milliseconds) or distance (meters, centimeters, feet, or inches). **Bypass** disables the Delay without changing settings.

Right-clicking over certain settings will provide a menu of additional options.

Controls



These Component Objects provide both internal and external control functions. Level Controls, Mute Buttons, and Invert may be connected between components within the Layout, for control of volume, muting, and polarity. Preset and Remote Preset Buttons may be placed within the Layout, and defined to recall specified Presets. Logic Gates and Logic Delay may be connected between component control nodes in the layout, to customize control behavior. V8, S8, VS8, and Voltage Command Box components may be placed within the layout, to represent their corresponding external control devices. Controls are available in pre-defined configurations, however, the configuration may be customized when being placed from the Object Toolbar.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.



see Level Control Dialog



see Invert Control Dialog



see Mute Button Control Dialog



see Preset Button Control Dialog



see Remote Preset Button Control Dialog



see Logic Gates



see Logic Delay Control Dialog



see V8 Control Dialog



see S8



see VS8 Control Dialog

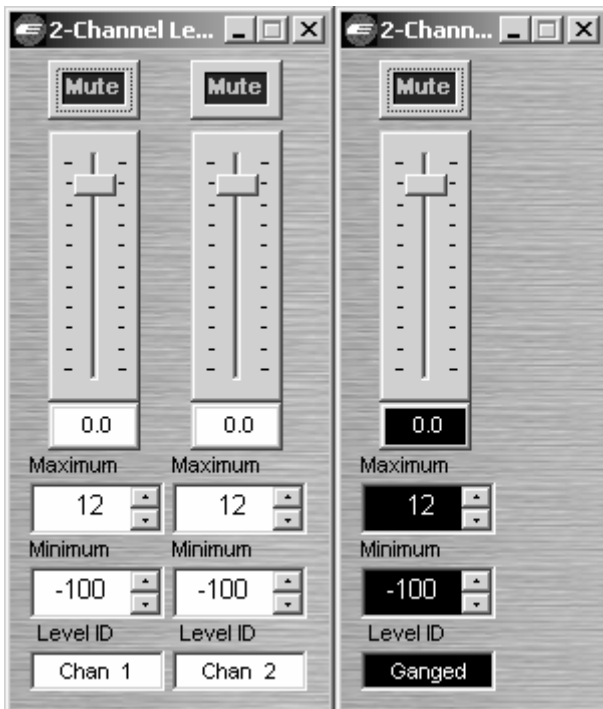


see Voltage Command Box

Right-clicking over the object provides a pop-up menu of options. Control Dialog Boxes for Level, Mute, and Preset related components can be minimized to create user control surfaces (see Customizing Component Objects).

Control Dialog

Level Control Dialog

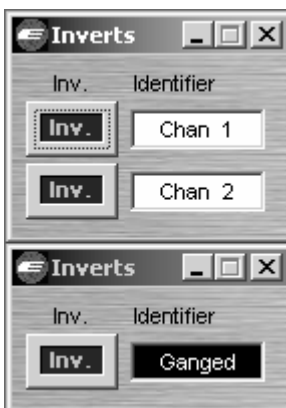


Mute turns on/off the channel. Channel level may be entered numerically, or may be adjusted by dragging the **fader**. **Maximum** and **Minimum** can be used to restrict the range of level adjustment provided by the fader. **Level ID** provides a custom label, when the dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Level Control components can be minimized to create user control surfaces (see Customizing Component Objects).

When placed from the Object Toolbar, multiple Level Controls may be 'ganged' together onto a single fader. Ganged Level Controls display a 'G' in the upper-right of the Component Object, and Level ID colors are reversed on the Control Dialog. Non-ganged Level Controls have a maximum of sixteen channels, whereas ganged Level Controls have a maximum of forty channels.

Invert

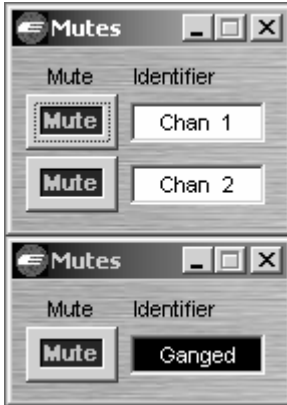


Invert reverses the polarity of the audio signal (180°). **Identifier** provides a custom label, when the dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Invert components can be minimized to create user control surfaces (see Customizing Component Objects).

When placed from the Object Toolbar, multiple Invert channels may be 'ganged' together onto a single control. Ganged Invert controls display a 'G' in the upper-right of the Component Object, and Identifier colors are reversed on the Control Dialog. Non-ganged Invert controls have a maximum of sixteen channels, whereas ganged Invert Controls have a maximum of forty channels.

Mute Button Control Dialog

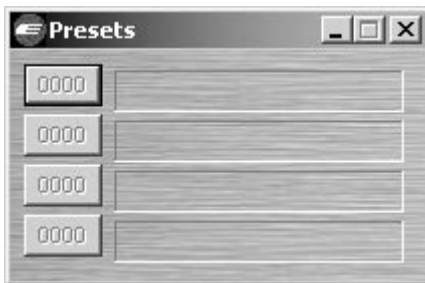


Mute turns on/off the channel. **Identifier** provides a custom label, when the dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Mute Button components can be minimized to create user control surfaces (see Customizing Component Objects).

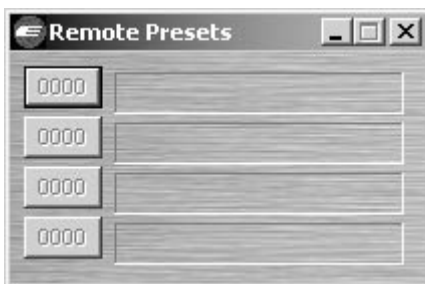
When placed from the Object Toolbar, multiple Mute Buttons may be 'ganged' together onto a single button. Ganged Mute Buttons display a 'G' in the upper-right of the Component Object, and Identifier colors are reversed on the Control Dialog. Non-ganged Mute Buttons have a maximum of sixteen channels, whereas ganged Mute Buttons have a maximum of forty channels.

Preset Button Control Dialog



Right-clicking over a button provides a list of available Presets which can be assigned to that button. The Preset Number will appear on the button, and the Preset Name will appear to the right. Preset Numbers can be replaced with the word 'Recall' (see General Options). Control Dialog Boxes for Preset Button components can be minimized to create user control surfaces (see Customizing Component Objects).

Remote Preset Button Control Dialog



Remote Preset Buttons are identical to Preset Buttons, except they have control input nodes on the block. These control input nodes allow presets to be recalled via control output nodes on other component blocks. This provides remote control of preset selection, both from internal components and external controls. Unlike most other blocks, multiple control output nodes may be connected to a single control input node on a Remote Preset Button. Control Dialog Boxes for Remote Preset Button components can be minimized to create user control surfaces (see Customizing Component Objects).

Logic Gates

Most Logic Gates have no Control Dialog Boxes. They are used only to customize behavior of other control functions in the system. Logic Gates are connected between the output and input control nodes of other components in the layout. These components can represent internal or external control functions.

Examples

Internal: Auto Mixer output nodes; Ducker input/output nodes; Remote Preset Button input nodes.

External: S8 output nodes; V8 output nodes; Voltage Command Box input/output nodes.

Logic Gates alter the normal operation of component control outputs in the following ways:

NOT: produces opposite/inverted operation (input ON turns output OFF; input OFF turns output ON).

AND: all inputs ON causes output to go ON (any inputs OFF causes output to go OFF).

NAND: all inputs ON causes output to go OFF (any inputs OFF causes output to go ON).

OR: any inputs ON causes output to go ON (all inputs OFF causes output to go OFF).

NOR: any inputs ON causes output to go OFF (all inputs OFF causes output to go ON).

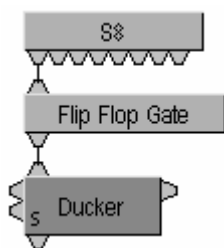
XOR: any inputs (except all) ON causes output to go ON (all inputs OFF/ON causes output to go OFF).

Flip Flop: produces toggle/latching operation (input ON changes output state, ON/OFF).

Logic State: provides manual latching operation only (includes no input node).

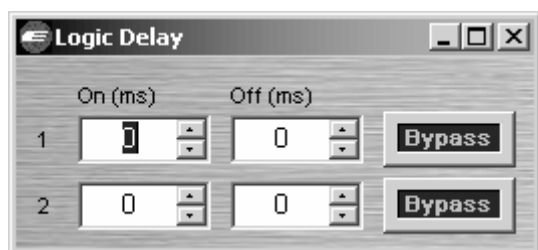
NOTES: *NOT and Flip Flop gates have only a single input per output, whereas most other gates have multiple inputs, up to 8. Flip Flop gates provide a control dialog box, for establishing their initial output state. Also, unlike most other blocks, multiple control output nodes may be connected to a single control input node on a Flip Flop gate. Control Dialog boxes for Logic State gates can be minimized to create user control surfaces (see Customizing Component Objects).*

Sample Application



Normally, a S8 control output connected to a Ducker control input provides a momentary operation (ducking occurs only as long as the S8 control is being pressed). However, connecting a Flip Flop Logic Gate between the S8 control output and the Ducker control input produces a press-on/press-off operation (ducking begins with the first press of the S8 control, and ceases only upon a second press of the S8 control).

Logic Delay



Logic Delays are connected between the output and input control nodes of other components in the layout. These components can represent internal or external control functions. Logic Delay outputs simply provide a delayed version of the changes received at their inputs. **On** sets turn on delay. **Off** sets turn off delay. The range for either selection is 0~60,000mS (1 minute). **Bypass** disable the delay without changing settings. Right-clicking over certain settings will provide a menu of additional options.

V8 Control Dialog

The V8 Control Dialog is a software interface for configuring eight channels of control. It is organized into two rows of four channels each. Each channel has the following controls:

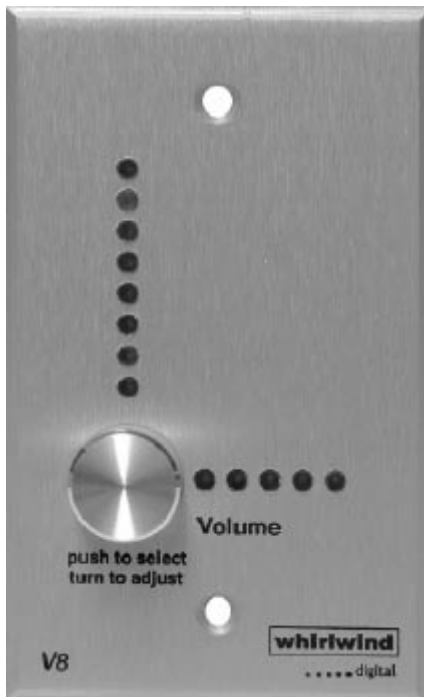
- Object Code:** A dropdown menu.
- Instance ID:** A dropdown menu.
- Control ID:** A dropdown menu with up/down arrows on either side.
- Identifier:** A text field.

The first row shows the following settings:

Channel	Object Code	Instance ID	Control ID	Identifier
1	I/O1	3	Level 1	Mic 1
2	Mixer2	1	Level In 1	Input 1
3	I/O2	2	Level 1	Out A
4				Chan. 4

The second row shows the following settings:

Channel	Object Code	Instance ID	Control ID	Identifier
5				Chan. 5
6				Chan. 6
7				Chan. 7
8				Chan. 8



The V8 is an external control device, which allows adjustment of eight selectable E Desk volumes. Volumes can be individual or grouped levels within E Desk. This includes Level Control blocks, as well as levels within other component blocks (such as Inputs/Outputs, Mixers, Equalizers, etc.).

V8 is represented in the layout as a block with no audio or control connections. All functions are assigned using the control dialog box. **Object Code** selects from a list of blocks found in the layout, and **Instance ID** is entered automatically, but both can be found easily using Object ID Inspector. **Control ID** selects from a list of available levels within the chosen block. Volume up/down buttons allow control of assigned levels directly from the dialog box. **Identifier** provides a custom label, when the dialog box is minimized (see below).

Control Dialog Boxes for V8 components can be minimized to create user control surfaces (see Customizing Component Objects).

V8 controls include a raceway (surface-mount) back-box, but will fit most US standard single-gang (flush-mount) back-boxes. Custom Control Labels may be printed for the V8. Please refer to the 'Installation Guide' (included with controls), or see Control Bus for more information. External controls must be identified (see Device Maintenance) and associated with their corresponding component blocks within the layout (see Equipment Table).

S8

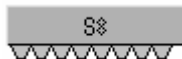


The S8 is an external control device, which allows initiation of eight selectable E Desk actions. Actions can be individual or grouped functions within E Desk. This includes recalling presets, ducking, combining, etc.

S8 components have no Control Dialog Boxes. They are represented in the layout as a block with eight control output nodes. These control output nodes are connected to control input nodes on the other component blocks to be controlled. These other components may include Remote Preset Buttons, Duckers, Room Combiners, and Voltage Command Boxes. Muting and room combining routines can also be achieved using presets. Voltage Command Boxes can provide logic outputs for controlling additional equipment, external to E Desk.

S8 behavior can be altered using Logic Gates.

S8 controls include a raceway (surface-mount) back-box, but will fit most US standard single-gang (flush-mount) back-boxes. Custom Control Labels may be printed for the S8.



Please refer to the 'Installation Guide' (included with controls), or see Control Bus for more information. External controls must be identified (see Device Maintenance) and associated with their corresponding component blocks within the layout (see Equipment Table).

VS8 Control Dialog

The VS8 Control Dialog window displays two rows of controls for configuring VS8 components. Each row contains four columns of controls:

- Object Code:** A dropdown menu.
- Instance ID:** A dropdown menu.
- Control ID:** A dropdown menu with up and down arrow buttons on either side.
- Identifier:** A text field.

The first row shows the following values:

- Object Code: I/O1
- Instance ID: 3
- Control ID: Level 1
- Identifier: Mic 1

The second row shows the following values:

- Object Code: Mixer2
- Instance ID: 1
- Control ID: Level In 1
- Identifier: Input 1

The third row shows the following values:

- Object Code: I/O2
- Instance ID: 2
- Control ID: Level 1
- Identifier: Out A

The fourth row shows the following values:

- Object Code: (empty)
- Instance ID: (empty)
- Control ID: (empty)
- Identifier: Chan. 4

The fifth row shows the following values:

- Object Code: (empty)
- Instance ID: (empty)
- Control ID: (empty)
- Identifier: Chan. 5

The sixth row shows the following values:

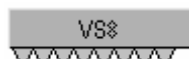
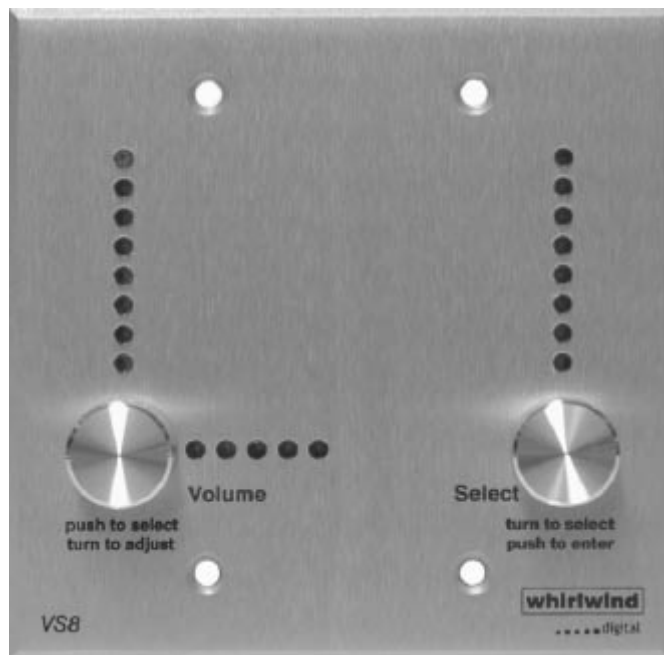
- Object Code: (empty)
- Instance ID: (empty)
- Control ID: (empty)
- Identifier: Chan. 6

The seventh row shows the following values:

- Object Code: (empty)
- Instance ID: (empty)
- Control ID: (empty)
- Identifier: Chan. 7

The eighth row shows the following values:

- Object Code: (empty)
- Instance ID: (empty)
- Control ID: (empty)
- Identifier: Chan. 8



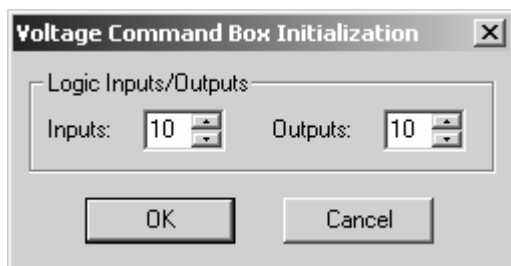
The VS8 is an external control device, which combines the functions of both V8 and S8 controls. Therefore, the VS8 is represented with a control dialog box (for volume functions), as well as a component block with control output nodes (for select functions).

Control Dialog Boxes for VS8 components can be minimized to create user control surfaces (see Customizing Component Objects).

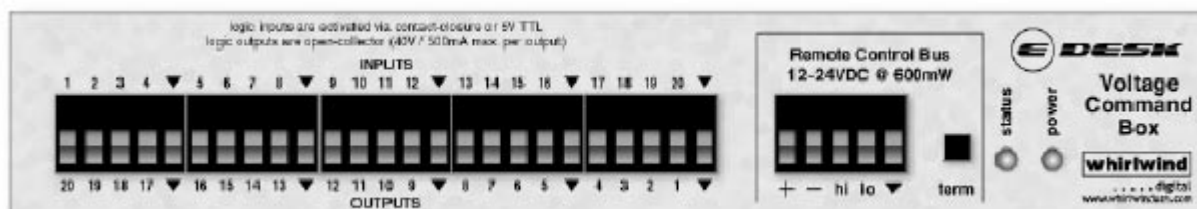
VS8 controls include a raceway (surface-mount) back-box, but will fit most US standard double-gang (flush-mount) back-boxes.

Custom Control Labels may be printed for the VS8. Please refer to the 'Installation Guide' (included with controls), or see Control Bus for more information. External controls must be identified (see Device Maintenance) and associated with their corresponding component blocks within the layout (see Equipment Table).

Voltage Command Box



The Voltage Command Box is an external control device, which provides twenty logic input/output connections. When a Voltage Command Box is placed, an Initialization Properties dialog box appears for assigning the quantities of logic inputs/outputs (20 total). Logic inputs allow external switches to initiate E Desk actions. Actions can be individual or grouped functions within E Desk. This includes recalling presets, ducking, combining, etc. Logic outputs can be used to control additional equipment, external to E Desk.



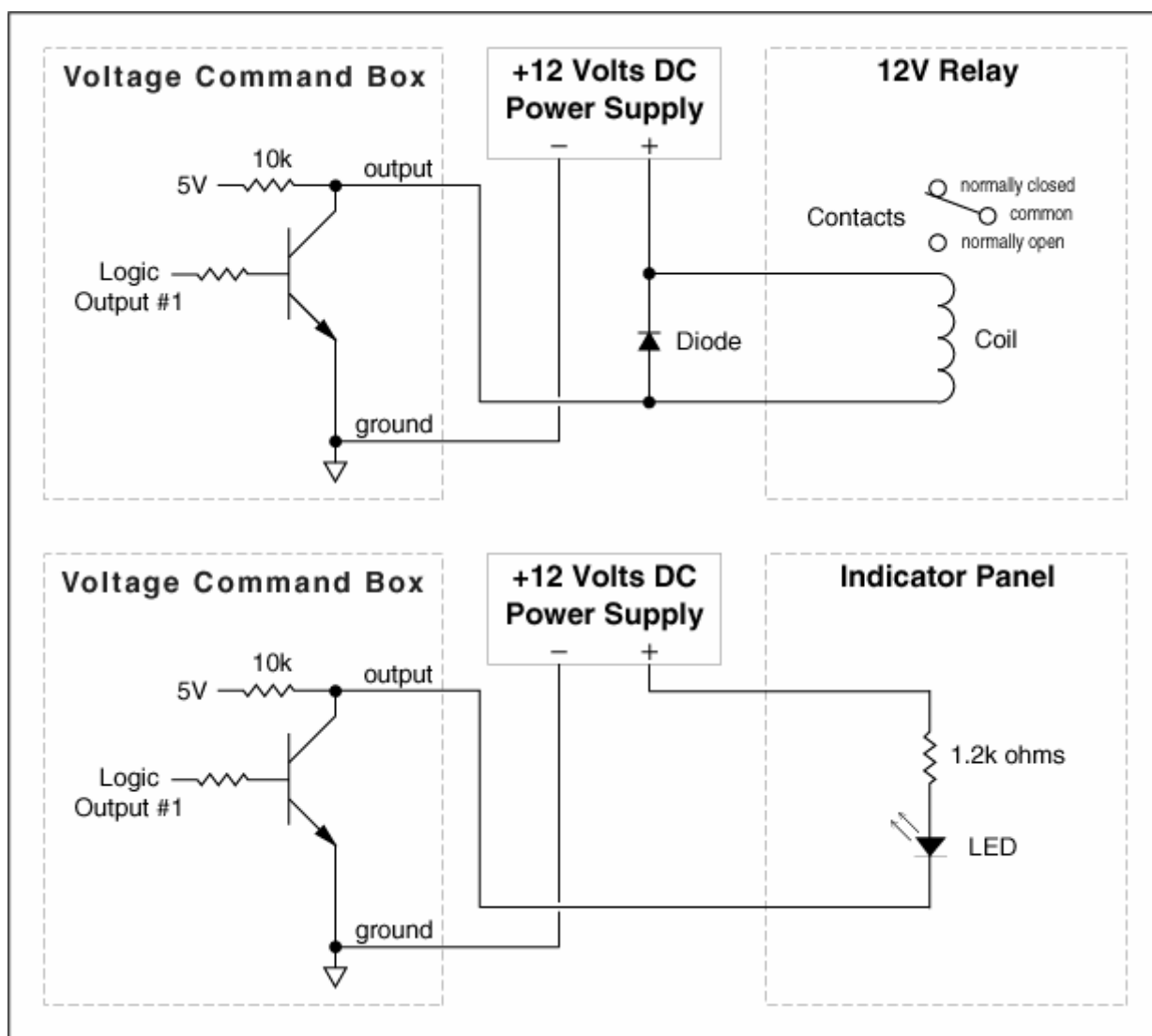
Voltage Command Box components have no Control Dialog Boxes. They are represented in the layout as a block with a total of twenty control input/output nodes. Logic Inputs (on the box) are represented as control output nodes (on the block). These control output nodes may be connected to control input nodes on other components, such as Remote Preset Buttons, Duckers, and Room Combiners. Logic Outputs (on the box) are represented as control input nodes (on the block). These control input nodes may be connected to control output nodes on other components, such as Auto Mixers, Duckers, and S8. Unlike other components, Voltage Command Box output nodes may be connected to input nodes on the same Voltage Command Box block, allowing Logic Inputs (external switches) to control Logic Outputs (external equipment).



Voltage Command Box behavior can be altered using Logic Gates. Please refer to the '[Installation Guide](#)' (included with controls), or see Control Bus for more information. External controls must be identified (see Device Maintenance) and associated with their corresponding component blocks within the layout (see Equipment Table).

Up to 20 logic inputs are available on the Voltage Command Box. Logic inputs allow remote control of E Desk via external circuits such as switches, relays, and logic outputs from other devices. When nothing is connected to a logic input, an internal pull-up resistor keeps it at a 'high' state (+5.0 VDC). The logic input is activated when its input goes 'low' (less than +0.8 VDC), and is de-activated when its input goes 'high' (greater than +2.0 VDC). A logic input can be controlled in one of three ways: 1) Using an 'open-collector' or 'open-drain' logic output from an external device to short the logic input to ground. 2) Using a switch, relay, or other contact-closure to short the logic input to ground. 3) Using an active 5V TTL output driver circuit (such as from a third-party controller) to actively drive the logic input to a 'high' or 'low' state. Multiple contact-closures or 'open-collector'/'open-drain' logic outputs may be wired in parallel to a single logic input (see diagram below). Open-collector or open-drain logic outputs and contact-closures should be rated for at least 5 Volts / 1mA operation. Active output driver circuits should not exceed a signal range of 0~5 Volts DC, and should have a minimum pulse width of 10 milli-seconds. The logic input impedance is approximately 10k ohms.

The Voltage Command Box provides up to 20 logic outputs. Logic outputs can be used to control relays and indicators or to drive logic inputs of other devices. The Voltage Command Box logic outputs are 'open collector' with an internal pull-up. Each logic output is an NPN transistor with the collector being the output and the emitter being ground (see diagram below). When a logic output is turned on, the transistor provides a path for DC current to flow, lowering the output voltage to below 0.8V. When a logic output is turned off, the internal pull-up resistor raises the output voltage to near 5V, depending on the output current. To activate external relays or indicators, an external power supply must be used (see diagram below). The logic output transistors are rated up to a maximum of 40 VDC and 500 mA per output (24 volt relay coils maximum). However, +12 Volts DC is sufficient power for most applications. When using the logic outputs to control relays, protection diodes must be used to suppress high voltage transients that are generated when the relays turn off (see diagram below).



Control Labels

The V8, S8, and VS8 controls all come with a sheet of clear, adhesive-backed labels, for custom printing on a laser printer. A Word document (V8S8 B Labels.doc) is available on the E Desk software CD and on the Whirlwind web site (www.whirlwindusa.com), as a label printing template. These labels are meant to be printed using desk-top laser printers only. It is recommended that the printer be set for 'label' printing, and the label sheet should be 'short-edge' feed from the 'bypass' tray. A test printing of a single label should be done, to assure proper alignment of text. To compensate for any mis-alignment of text, margins within the Word document may be adjusted. Care should be taken in placement of the labels onto the controls. To avoid finger-prints, the use of a knife-blade or tweezers is recommended for handling. Severe bending or curling of the label may cause loss of some toner (text). When placing the label on the control panel, use the vertical column of LED indicators as a visual reference of alignment. Once the label is in place, a second (un-printed) label may be placed over the first label, to provide protection against wear. Each sheet contains 25 labels, so in case of errors, additional labels may be printed.

In the Word document, select Show Gridlines from the Table menu. Each large cell represents a label. The first four columns are 'left-justified' to create labels for V8 and S8 panels, as well as for the 'Volume' (left) section of VS8 panels. The last column is 'right-justified' to create labels for the 'Select' (right) section of VS8 panels. Left-click inside any large cell, and begin typing. Use 'Enter' to begin a new line, and again to leave a blank line. To avoid printing errors, do not change line-spacing or other formatting parameters. However, if you do not have the default font (Helvetica), or if you wish to change label appearance, you may select a different font before typing.

Meters



These Component Objects provide signal present, peak, and RMS metering functions. Meters may be connected to any component output, and may be used for diagnostic and setup purposes, or for applications which require real-time metering. Meters are available in pre-defined configurations, however, the configuration may be customized when being placed from the Object Toolbar.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see Signal Present Meter Control Dialog

 see Peak Meter Control Dialog

 see RMS Meter Control Dialog

Right-clicking over the object provides a pop-up menu of options. Control Dialog Boxes for Meters components can be minimized to create user control surfaces (see Customizing Component Objects).

Control Dialog

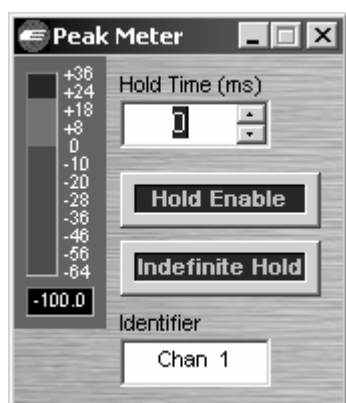
Signal Present Meter Control Dialog



Threshold determines at what level the signal present indicator will light. **Identifier** provides a custom label, when dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Meters components can be minimized to create user control surfaces (see Customizing Component Objects).

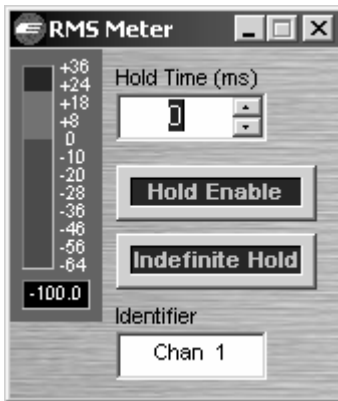
Peak Meter Control Dialog



A peak-reading meter & numeric display indicate signal level. **Hold Time** determines how long the meter will display the most recent level increase. **Hold Enable** turns the Hold Time function on/off. **Indefinite Hold** causes the Hold function to be continuous, updating the display only when levels increase beyond the current reading. **Identifier** provides a custom label, when dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Meters components can be minimized to create user control surfaces (see Customizing Component Objects).

RMS Meter Control Dialog



An RMS-reading meter & numeric display indicate signal level. **Hold Time** determines how long the meter will display the most recent level increase. **Hold Enable** turns the Hold Time function on/off. **Indefinite Hold** causes the Hold function to be continuous, updating the display only when levels increase beyond the current reading. **Identifier** provides a custom label, when dialog box is minimized (see below).

Right-clicking over certain settings will provide a menu of additional options. Control Dialog Boxes for Meters components can be minimized to create user control surfaces (see Customizing Component Objects).

Generators



These Component Objects provide sine-wave, sweep, pink-noise, and white-noise generator functions. Generators may be connected to any component input, and may be used for diagnostic and setup purposes, or for applications which require tones or sound-masking.

Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see Tone Generator Control Dialog

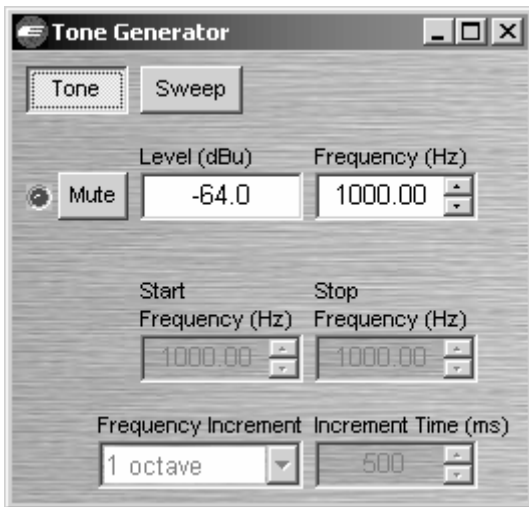
 see Pink Noise Generator Control Dialog

 see White Noise Generator Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

Tone Generator Control Dialog



Tone selects a single frequency. **Sweep** selects a range of frequencies (instead of a single tone). **Mute** turns on/off the generator. **Level** determines the generator output level. **Frequency** determines the frequency for Tone. **Start Frequency & Stop Frequency** determine the range of frequencies for Sweep. **Frequency Interval** selects the spacing (and quantity) of individual tones for Sweep. **Time Interval** determines the time each tone is held for Sweep.

Right-clicking over certain settings will provide a menu of additional options.

Pink Noise Generator Control Dialog



Mute turns on/off the generator. **Level** determines generator output level.

Right-clicking over certain settings will provide a menu of additional options.

White Noise Generator Control Dialog



Mute turns on/off the generator. **Level** determines generator output level.

Right-clicking over certain settings will provide a menu of additional options.

Diagnostics



These Component Objects provide Transfer Function displays for diagnostic purposes. Transfer Function may be connected between any two component outputs on the same signal path, for a comparative analysis of processing.

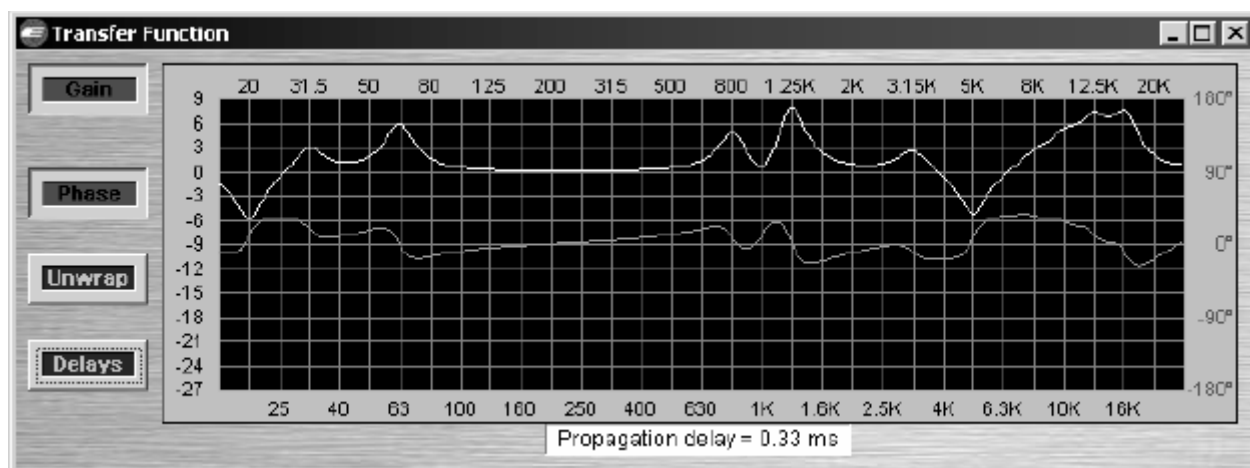
Once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

 see Transfer Function Control Dialog

Right-clicking over the object provides a pop-up menu of options.

Control Dialog

Transfer Function



Transfer Function may be connected between any two component outputs on the same signal path, for a comparative analysis of processing. **Gain** displays the difference in frequency response between the two comparison points, as a white line. **Phase** displays the phase relationship between the two comparison points, as a green line. **Unwrap** removes out-of-range phase rotations from the phase display. **Delays** adds the effect of user-placed delay blocks (Delay and Matrix Mixer w/ Delay) into the phase display. The Phase display does not indicate inherent propagation delay within the system. **Propagation delay** is indicated separately at the bottom of the dialog box (1/3mS hops, if not compiled...or...real-time including equalization delay, if compiled). When a Transfer Function dialog box is open, the associated signal path is indicated as a dashed red line in the layout.

Specialty



These Component Objects provide Pass-Through and Split Pass-Through functions, to aid in the organization of system connections. Pass-Through blocks allow wiring nodes to be strategically placed, so audio or control (logic) signals can be routed in different directions. Split Pass-Through blocks allow associated input and output wiring nodes to be placed in separate locations, with an implicit or 'wireless' connection being maintained between them.

Pass Through and Split Pass Through blocks simply allow custom signal routing, and provide no actual processing of their own. Therefore, they do not have Control Dialog Boxes. Instead, an Initialization Properties window appears, for component definition and customization, when these blocks are placed into the Layout.

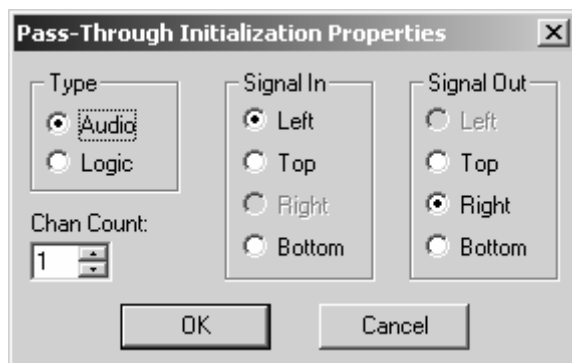
 see Pass-Through

 see Split Pass-Through Input

 see Split Pass-Through Output

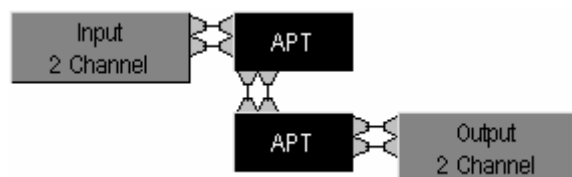
Control Dialog

Pass-Through



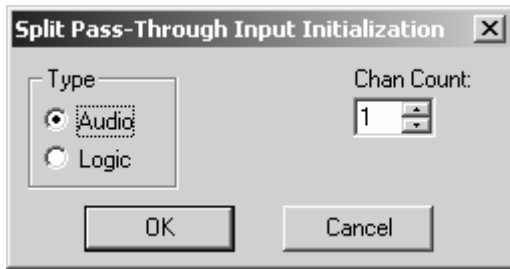
Pass-Through blocks allow wiring nodes to be strategically placed, so audio or control (logic) signals can be routed in different directions.

Type selects whether the block is for audio or logic connections. **Channel Count** selects the quantity of input/output connections to be provided on the block. **Signal In** determines the physical location of input wiring nodes on the block. **Signal Out** determines the physical location of output wiring nodes on the block.



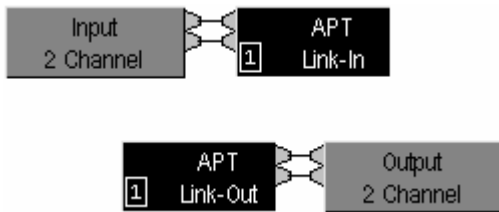
Pass-Through blocks simply allow custom signal routing, and provide no actual processing of their own. **APT** stands for Audio Pass-Through. **LPT** stands for Logic Pass-Through. This example shows a pair of 2-channel Audio Pass-Through blocks used to create a double-bend.

Split Pass-Through Input



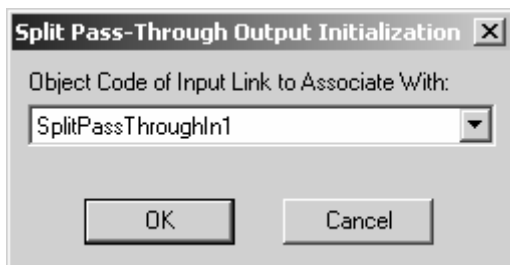
Split Pass-Through blocks allow associated input and output wiring nodes to be placed in separate locations, with an implicit or 'wireless' connection being maintained between them.

Type selects whether the blocks are for audio or logic connections. **Channel Count** selects the quantity of input/output connections to be provided on the blocks. Separate 'Link-In' and 'Link-Out' blocks are placed for input and output connections. Wiring nodes appear on the left side of input blocks and on the right side of output blocks. Link-In and Link-Out blocks are also numbered to identify their association. More than one Link-Out block can be placed in association with an existing Link-In block (see Split Pass-Through Output).



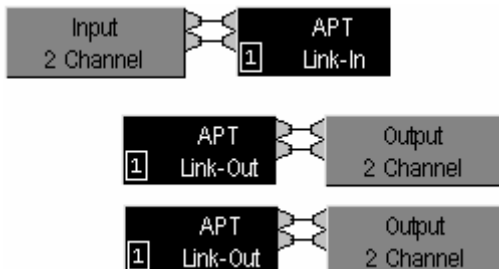
Split Pass-Through blocks simply allow custom signal routing, and provide no actual processing of their own. **APT** stands for Audio Pass-Through. **LPT** stands for Logic Pass-Through. This example shows a 2-channel Audio Split Pass-Through.

Split Pass-Through Output



More than one Link-Out block can be placed in association with an existing Link-In block (see Split Pass-Through Input).

Object Code of Input Link to Associate With selects which existing Link-In block the new Link-Out block should be associated with. The new Link-Out block will include the appropriate number of output wiring nodes, and the same numbered association, as other Link-Out blocks already associated with the selected Link-In block. Additional Link-Out blocks allow a single set of input connections to be distributed to multiple sets of output connections.



Pass-Through blocks simply allow custom signal routing, and provide no actual processing of their own. **APT** stands for Audio Pass-Through. **LPT** stands for Logic Pass-Through. This example shows an existing 2-channel Audio Split Pass-Through with an additional 2-channel Link-Out block.

System Design

Placing Component Objects

E Desk™ system design begins with the placement of Component Objects into the Layout. This can be done in two ways. The simplest way is to select a component category from the Equipment Room, and then drag & drop a pre-defined component into the Layout. Equipment Room component categories can also be selected from the Equipment Room Menu (at the top of the screen), which indicates keyboard short-cuts as well. However, component placement can instead be done using the Object Toolbar, located directly above the Layout. On the Object Toolbar, next to each category icon is a drop-down menu of components. Selecting a component from the menu, then clicking over the Layout, will place the selected component at that location. Holding the *Shift* key allows multiple copies of the component to be placed. Certain components will provide a pop-up window, allowing further component definition & customization before placement. Using the Object Bar also allows the Equipment Room to be closed (providing greater width to the Layout). Component Objects, and their current settings (DSP data), can also be placed using the Copy/Paste functions on the Standard Toolbar or the Edit Menu. Selected objects can also be copied by holding the *Alt* key while dragging and dropping. **NOTE:** *Components cannot be selected when the current Layer is invisible (see Layers Sheet).*

Arranging Component Objects

The physical arrangement of objects within the Layout can be modified in several ways. Objects can be packed side-by-side, have their edges aligned, be centered in the view, be spaced evenly, and be made the same size. Objects can also be arranged from front to back, when multiple objects are overlaid. In addition, objects can be forced to snap to an adjustable grid. See Layout Toolbar and Layout Menu. Objects within the Layout can also be organized in separate groups called Layers (see Layers Sheet).

Connecting Component Objects

Each Component Object includes Nodes for making system wiring connections. Nodes are provided in four types, each with a specific location on the Component Object. Audio input Nodes are always on the left. Audio outputs Nodes are always on the right. Control (logic) input Nodes are always on the top. Control (logic) output Nodes are always on the bottom. An exception to these rules is the Pass-Through block, which allows wiring nodes to be strategically placed for routing signals in different directions. When an object (such as a Ducker) includes an audio control (sense) input, it will be below the audio inputs (on the left).

To make a connection, select a Node and drag/drop a Line Object (wire) to a corresponding Node. Multiple Nodes on one object can be selected, and then connected to a matching set of multiple Nodes on another object. If multiple Nodes from individual objects are to be connected to multiple Nodes on a single object, select the individual object Nodes first (drag to select as group). Nodes from multiple individual objects must be connected to Nodes of other individual objects one at a time.

An output Node can be connected to multiple input Nodes, but an input Node cannot be connected to multiple output Nodes. Audio Nodes & Control (logic) Nodes cannot be connected to each other. Input & Output Nodes on the same object cannot be connected to each other. Nodes of the same type (Input or Output) cannot be connected together.

An individual Line Object (wire) or Node connection can be moved (but not copied). The appearance & properties of Line Objects (wires) in the Layout can be changed (see Format Toolbar and Property Sheet).

Component Object Properties

Component Object Properties are the control settings available for each component. These represent the same settings normally found on equivalent analog audio products. Component Object Properties for a selected component can be viewed/edited (in table form) using the Object Property Sheet. They can also be copied & pasted (as DSP Data) between components of the same type, using the Edit Menu. However, once a Component Object is placed into the Layout, all available settings can be accessed by double-clicking over the object. This produces a Control Dialog Box, which displays the component controls in a more conventional user interface.

There are twelve Component Object categories, with some categories providing several component variations. Each component type will have a unique Control Dialog Box. For more information on Control Dialog Boxes for specific components, select the desired category from the list below.



see Input Output



see Mixers



see Equalizers



see Filters



see Crossovers



see Dynamics



see Routers



see Delays



see Controls



see Meters



see Generators



see Diagnostics

Customizing Component Objects

Component Objects can be customized in several ways. First, when using the Object Toolbar to place components into the Layout, certain components will present the user with a pop-up window of configuration options. Several pre-defined configuration (input/output) options may be available for the component, as well as a 'custom' selection that allows the user to more specifically configure the component. Some components (such as Auto Mixers) will also allow activation of additional functions (such as Logic Inputs & Direct Outputs). Also, multiple channels of Level Control may also be 'ganged' together onto a single fader.

Actual component settings can be customized through Control Dialog Boxes (see Component Object Properties). Control Dialog Boxes for certain Combiners, Dynamics, Controls, & Meters components can be minimized to create customized control surfaces (room combiners, meters, level controls, mute buttons, preset buttons, etc.). These control surfaces can then be made user accessible only on specific Layers and with specific Passwords. (See Software User Interface.)

Individual or multiple Component Objects can be customized, connected, and then saved as new Component Objects in the Equipment Room. This can be done by selecting the desired object(s) in the Layout, then pressing *ALT* and dragging the object(s) into an appropriate category in the Equipment Room. *ALT* can also be used to drag object(s) between design (.DAP) files, and to copy objects within the same Layout. Right-clicking over objects (to Copy) and then right-clicking over a Equipment Room category (to Paste), can also be used.

Multiple component objects may be merged together using the Custom Blocks menu. Custom Blocks can then be copied to the Equipment Room as mentioned above. Custom Blocks can simplify the design process by integrating frequently used component combinations, and can provide password protection for intellectual property such as unique processing and component settings.

Right-clicking over the Equipment Room will also allow new category files (.APL) to be created, for quick access to specialized or often-used components. Existing category files (.APL) can be closed, to customize the Equipment Room. All available category files (.APL) can be viewed and opened from the Equipment Room Menu and from the Open dialog box.

Object and Layout Text

The size and appearance of both text and objects can be customized. Special Text Objects can be placed into the Layout using the Text cursor on the Object Toolbar. When selected, Component & Text Objects display handles which can be dragged for re-sizing. Right-clicking over an object provides a pop-up menu which includes the Edit Text option. Edit Text can also be accessed for a selected object by simply pressing the *Enter* key. Text (and object) appearance can be customized using the associated tools on the Format Toolbar.

System Compiling Considerations

Once a system design is created (components placed & connected), the system can be compiled by selecting Compile from either the File Menu or the Standard Toolbar. Compile provides system design analysis and calculates DSP processing requirements. Compile also makes initial determinations of quantity/type of **E Desk™** devices needed, **CobraNet™** channel assignments, allocation of DSP resources, and I/O channel number assignments. In addition, Compile will provide indication of system design errors.

Although Compile is an automatic process, certain settings can be pre-determined to help guide this process. DSP blocks (components) can be Allocated To Unit, which assigns them to a particular **E Desk** device. This can be useful either to dedicate particular audio functions to specific physical locations, or to reduce the number of CobraNet channels being transmitted between **E Desk** devices (reduces propagation delay).

Propagation Delay (also known as Latency) is an inherent time delay of the audio signals, which increases with the amount of DSP processing and CobraNet routing applied. Each CobraNet 'hop' (one-way transmission) produces 5.33mS delay (see CN Latency). Therefore, system outputs can have different amounts of propagation delay. Compile determines worst-case propagation delay for a system, and applies Delay Equalization to synchronize all audio outputs. In applications where audio output synchronization is not important (audibly isolated areas), then Delay Equalization may be disabled on individual Input Output components (DSP blocks) or system wide. See Object Property Sheet and Compile Options.

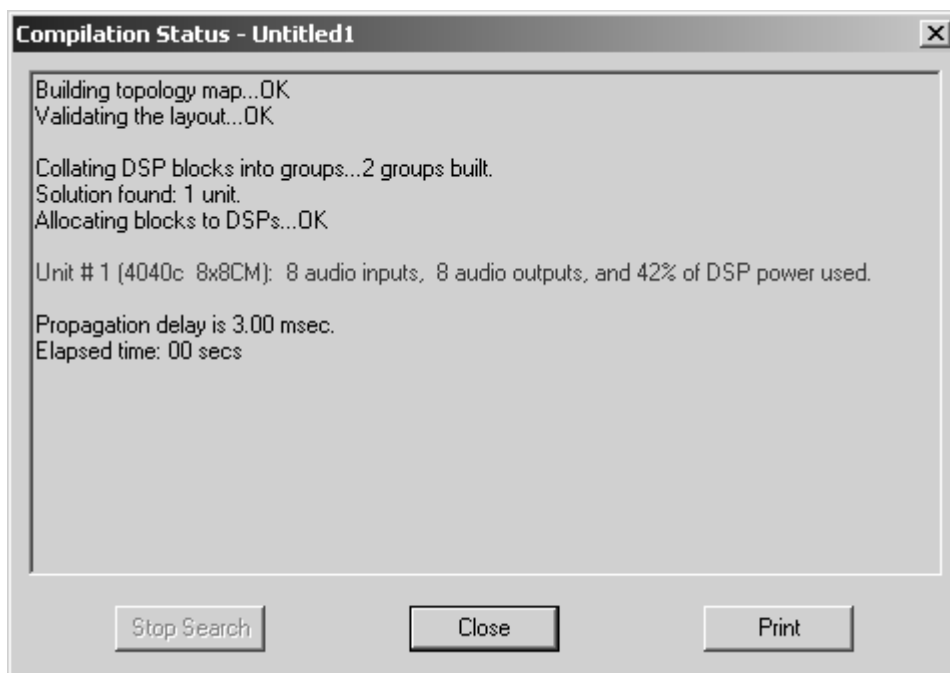
Compile also attempts to 'group' simple DSP blocks together, reducing the number of DSP blocks to be allocated to the available **E Desk** devices. Allocated To Gang can be used to 'gang' specific components (DSP blocks) into the same group and, therefore, the same device.

Compile will automatically add appropriate **E Desk** devices to the system, based upon Input & Output needs of the design. However, this Auto Device Add function may be defeated, and **E Desk** devices may be added manually, using the Equipment Table. Also, I/O Preference can be changed, to force Compile to use a specific **E Desk** device (Input/Output configuration).

For visual aids in determining DSP block allocations, see Display Options. A system design file must be compiled before it can be downloaded to **E Desk** devices (see Send Configuration).

Compile results may be reviewed at any time (see Tools Menu > Layout Compile Results).

Example of Compile results for a simple system



 see a list of possible Compile Error Messages

Channel Number Assignments

Release Notes for E Desk version 1.0

The suggested procedure for assignment of channel numbers to I/O blocks is as follows. It is assumed that all blocks are assigned to the same E Desk unit. If the system contains multiple units, the following procedure should be performed several times.

As always, the compiler does not modify the existing channel assignments if the I/O block has a fixed allocation to an E Desk unit. Therefore, in order to reassign the channel numbers in the desired way, it is necessary to unassign them first. To do this, select all I/O blocks for the unit in question and open the Property Sheet. Select the "DSP Attributes 1" tab and change the value in the "Allocated To Unit" field to 0 (you will have to set the flag "Fixed In Unit" to "No" first). This will reset the channel number assignments in the selected I/O blocks. Then change the "Allocated To Unit" field back to its original value and set the flag "Fixed In Unit" back to "Yes". Unselect all DSP blocks by left clicking in the view.

The next step is to indicate to the compiler the desired order in which you want the channel numbers assigned. Repeat the following sequence for each I/O block in the order you want the channel numbers assigned, *i.e.*, I/O block with the lowest channel number(s) first, I/O block with the highest channel number(s) last:

- Select the block by left-clicking on it
- Bring it to front by hitting CTRL+F.

Now recompile, and the channel numbers will be assigned in the order you selected the blocks.

Note: the Input and Output blocks for a given single unit can be processed at the same time.

Compile Error Messages

Validation of the Topology Map

Message: The Automatic Mixer (object code '___') at [__,__] has no active audio output.

Explanation: An Auto Mixer Main Output is connected to a Mix-Minus Combiner input, but appropriate audio output connections have not been made. Mix-Minus Combiners allow Auto Mixers to share control data only, and do not support audio input or output.

Message: Unintended use of Combiner block detected.

Explanation: A source, other than an Auto Mixer Main Output, is connected to a Mix-Minus Combiner input. Mix-Minus Combiners allow Auto Mixers to share control data only, and do not support audio input or output.

Message: The main output of an Auto Mixer is connected to more than one Combiner block.

Explanation: The main output of an Auto Mixer can be connected to only a single Combiner input (Mix-Minus or Room). Otherwise, Auto Mixer control data might be shared with multiple groups of combined mixers, causing convoluted behavior.

Message: Empty layout !

Explanation: No objects have been placed in the layout.

Messages: There are no audio sources or destinations.
There are no audio sources.
There are no audio destinations.

Explanation: No audio input/output objects have been placed (or connected) in the layout.

Messages: Some DSP blocks do not have inputs. Ignore them ?
Some DSP blocks do not have outputs. Ignore them ?
Some DSP blocks are not connected to any audio output. Ignore them ?

Explanation: These messages appear only if the flag 'Prompt To Stop Compilation On Warnings' is set under Tools>Options>Compile. If the choice to 'Ignore' is selected, then the warning "Ignored '...' (object code '...') at [__, __]" will be listed in the compile results. If the 'Prompt To Stop Compilation On Warnings' flag is not set, then compilation proceeds and 'Ignores' automatically.

Messages: The algorithm for the'__' block (object code '__') at [__,__] has been deprecated.
You should replace the existing block with a newly created one which uses the most up to date algorithm.
You should replace the existing blocks with newly created ones which use the most up to date algorithms.

Explanation: The first warning is issued for each DSP block in the layout that is considered outdated. One of the subsequent messages will also appear, depending upon whether there is only one outdated block or multiple outdated blocks detected.

Messages: The algorithm for the'__' block (object code '__') at [__,__] has been eliminated.
You should replace the existing block with a newly created one which uses the most up to date algorithm.
You should replace the existing blocks with newly created ones which use the most up to date algorithms.

Explanation: These messages are similar to the ones above. The difference is that they are not warnings, but errors.

Message: Channel numbers have been reset in some audio I/O blocks.
Re-compile to update the channel number assignments.

Explanation: Channel numbers were assigned in an input/output object, and that object was assigned to a specific E Desk unit by fixed allocation.
Therefore, the channel numbers also became fixed. Then the E Desk I/O configuration was changed in the Equipment Table.
Since the new I/O configuration has less input or output channels, some channel numbers have become invalid.
Once reset, Compile will automatically re-assign channel numbers.

Message: Nothing to compile !

Explanation: All objects placed in layout have been ignored.

Messages: Insufficient audio inputs and outputs to implement this layout.
Insufficient audio inputs to implement this layout.
Insufficient audio outputs to implement this layout.

Explanation: The design requires more input/output channels than are available from the E Desk device(s) specified in the Equipment Table. This can only occur if the flag 'Auto Device Add' is not set under Tools>Options>Compile.

Message: Insufficient computing power to implement this layout.

Explanation: The design requires more DSP resources than are available from the E Desk device(s) specified in the Equipment Table. This can only occur if the flag 'Auto Device Add' is not set under Tools>Options>Compile.

Message: Feedback loop detected.

Explanation: The potential exists for an audio path to be indirectly looped back upon itself. This condition could be dangerous, and is not allowed.

Messages: Specified E Desk unit #__ is not in the Equipment Table.
Specified E Desk unit #__ is not selected for use.

Explanation: Some DSP blocks have been assigned as fixed allocations in a specific E Desk unit which is not available or selected for use.

Messages: Too many audio inputs required for fixed allocations in unit #__.
Too many audio outputs required for fixed allocations in unit #__.
Unit #__ has no CobraNet communication module.
Too many CobraNet inputs or outputs allocated to unit #__.

Explanation: The number of audio channels assigned as fixed allocations in a specific E Desk unit exceeds the capacity of that unit.

Messages: Insufficient DSP power for fixed allocations in unit #__: __% of capacity requested.

Explanation: The DSP resources assigned as fixed allocations in a specific E Desk unit exceed the capacity of that unit.

Message: Gang #__ requires too many resources.

Explanation: The component objects allocated to the specified gang require more resources (audio channels, CobraNet channels, and/or DSP power) than is available from any current E Desk unit.

Messages: DSP tasks for fixed allocations in unit #__ cannot be scheduled.
DSP tasks for gang #__ cannot be scheduled.

Explanation: Either fixing the allocations or ganging the DSP blocks dictates that the DSP blocks be located in the same Audia unit. However, in this case it is not possible to distribute the DSP blocks among the available DSPs in that unit. See also 'Allocation of DSP blocks to DSPs' below.

Allocation of DSP blocks to Audia Devices

Message: Too many combinations. Try to reduce the number of groups by combining DSP blocks.

Explanation: The possibilities are too numerous to determine a solution within a reasonable period of time. Reduce the number of groups by ganging components together or giving them fixed allocations.

Message: Group #__ has too many connections to be placed into an E Desk unit.

Explanation: The specified group requires so many links to other groups that it would exceed the 'bundle' limitations of CobraNet. Normally, the number of CobraNet connections could be reduced by combining the specified group with some other group(s). However, in this case, it would require more resources than available in a single E Desk unit. Attempt to produce more compact groups, with fewer connections, using fixed allocations and/or ganging. This can also happen if CobraNet I/O blocks have been placed into a non-CobraNet unit.

Message: Could not place group #__ anywhere. There might be a contention on group(s)_____.

Explanation: The specified group requires so many links to other groups that it would exceed the 'bundle' limitations of CobraNet. Normally, the number of CobraNet connections could be reduced by combining the specified group with some other group(s). However, in this case, the number of CobraNet connections cannot be reduced sufficiently.

Message: Could not find a solution.

Explanation: Compile was unable to place the produced groups into available E Desk units. Attempt to use fixed allocations and/or ganging to change the formation of groups..

Message: Although the total DSP power is sufficient, the compiler cannot place the resulting groups into the E Desk units in the Equipment Table. More units would have to be added.

Explanation: Compile was not able to distribute the produced groups among the available E Desk units. This can only occur if the flag 'Auto Device Add' is not set under Tools>Options>Compile. Attempt to produce smaller groups using fixed allocations and/or ganging. If unsuccessful, set 'Auto Device Add' so Compile will automatically add necessary E Desk units to the Equipment Table. E Desk units can also be added manually.

Message: Total maximal duration of delays exceeded in the unit #_.
Explanation: The number of delay blocks, and their combined delay ranges, exceeds the maximum capability of this unit. Currently, any single E Desk unit can provide a maximum of 45 seconds of delay blocks. Matrix Mixers with Delay also contribute to this total, consuming 1 second per input channel.

Allocation of DSP blocks to DSPs

Message: Allocating blocks to DSPs...failed to set up a feasible DSP task schedule in the unit #__. You should move some processing blocks from this unit into another unit using fixed allocations.
Explanation: Although the total DSP power in the E Desk unit is sufficient, compile was not able to distribute the component objects among the available DSPs. When the DSP load approaches 100%, it becomes crucial that the objects be distributed more uniformly. Try moving certain objects to another unit (using fixed allocations), or replace them with a comparable set of smaller objects (within the same unit). Otherwise, it may be necessary to add an additional E Desk unit to the system, and move large DSP blocks into it using fixed allocations.

Assigning control blocks to E Desk units

Message: Some unconnected control blocks have been ignored.
Explanation: Control blocks with no connections have been excluded from the system. Only Logic Gate , Logic Delay, and Remote Preset Button blocks can be ignored. When connected to the system, control dialogs for ignored blocks cannot be accessed.

Message: Feedback detected in the control network.
Explanation: The potential exists for a control path to be indirectly looped back upon itself. This condition could be dangerous, and is not allowed.

Message: Unit #__ has too many control connections.
Explanation: Although quite large, there is a limit to the quantity of control connections within a single unit. Connections include both internal (source and destination within same unit) and external links (source or destination within this unit). Try moving certain control objects to another unit (using fixed allocations),

Setting up the E Desk units after a successful compilation

Message: Could not assign audio I/O channels in the unit # ____.

Explanation: Indicates a software problem. Please contact Whirlwind.

Messages: Available range of Instance IDs is nearly exhausted.

Range of Instance IDs has been exhausted.

Explanation: The total number of Instance IDs, as assigned to component and line objects, is limited to 65,535. When component objects are removed from a design, their Instance IDs are not automatically re-assigned to new component objects. Therefore, the messages above indicate that a significant number of Instance IDs has been wasted. Set 'Reassign Instance IDs' under Tools>Options>Compile and re-compile to recover wasted Instance IDs. **CAUTION:** *This will change most component Instance IDs, and will render existing external control command scripts useless.* Once Instance IDs have been recovered, turn off 'Reassign Instance IDs' to avoid further re-assignments.

System Network Considerations

The computer must have a 10/100 BaseT network card (NIC) installed. When connecting directly to the Ethernet port on single **E Desk™** unit, a 'cross-over' CAT5 cable is used. When connecting to a network (or system) of multiple **E Desk** units, a 'straight-through' CAT5 cable is used (via an Ethernet switch). A separate switched Ethernet network is strongly recommended for CobraNet, and is mandatory when using multicast bundles. Ethernet switches (not 'hubs') must be 10/100 BaseT compatible, with sufficient ports for connection to each **E Desk** unit (multiple switches may be used). If Ethernet switches are 'managed', be careful to assign all CobraNet connections to 100 BaseT, and all Ethernet connections to 10 BaseT. These connections also use 'straight-through' CAT5 cables. When a system using only two E Desk devices has been configured, and the computer connection is removed, both Ethernet and CobraNet connections may be made directly between the two units using 'cross-over' CAT5 cables.

Ethernet and CobraNet both have a cable length limitation of 100 meters, between the Ethernet switch and an E Desk device. However, fiber-optic cable may be used to extend this distance limitation to 2 km. Fiber-optic cable can be used with switches that have fiber-optic ports, or media converters can be used to interface fiber-optic cable with standard RJ-45 ports.

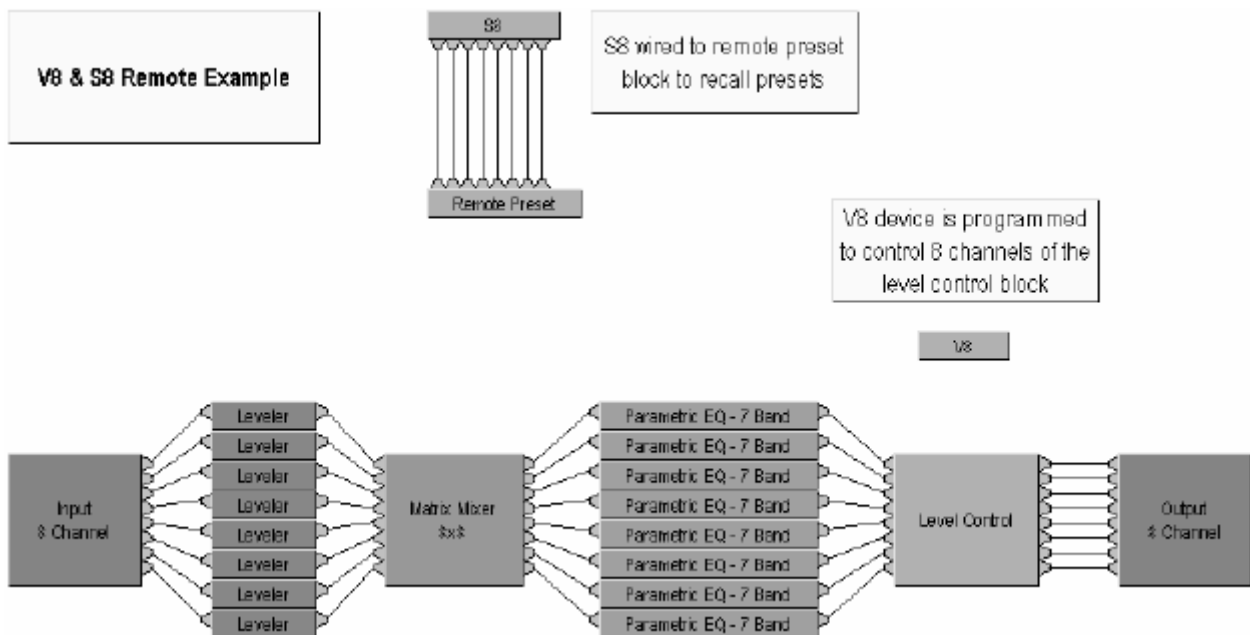
Due to network delay, CobraNet has a limitation of seven (7) 'hops' (one-way transmissions) within a network. Additionally, because CobraNet transmits (32) channels of digital audio on (4) 'bundles' of (8) channels, each E Desk device can transmit digital audio to no more than (4) other Audia devices within a network. The same is true for receiving digital audio over CobraNet. When utilizing CobraNet Latency of 1.33mS (see Equipment Table), the total number of bundles (transmit + receive) for an E Desk device is reduced to four.

The computer must be assigned an IP address (under Network Card Settings>Properties). Most computers set TCP/IP address automatically, but **E Desk** devices require manual assignment. Initially, the computer IP addresses should be assigned as **169.254.1.X** (where range of X = 1~254). Each **E Desk** device must also be assigned a unique IP address (see Device Maintenance). The factory default IP address for all E Desk devices is 169.254.1.200.

Applications

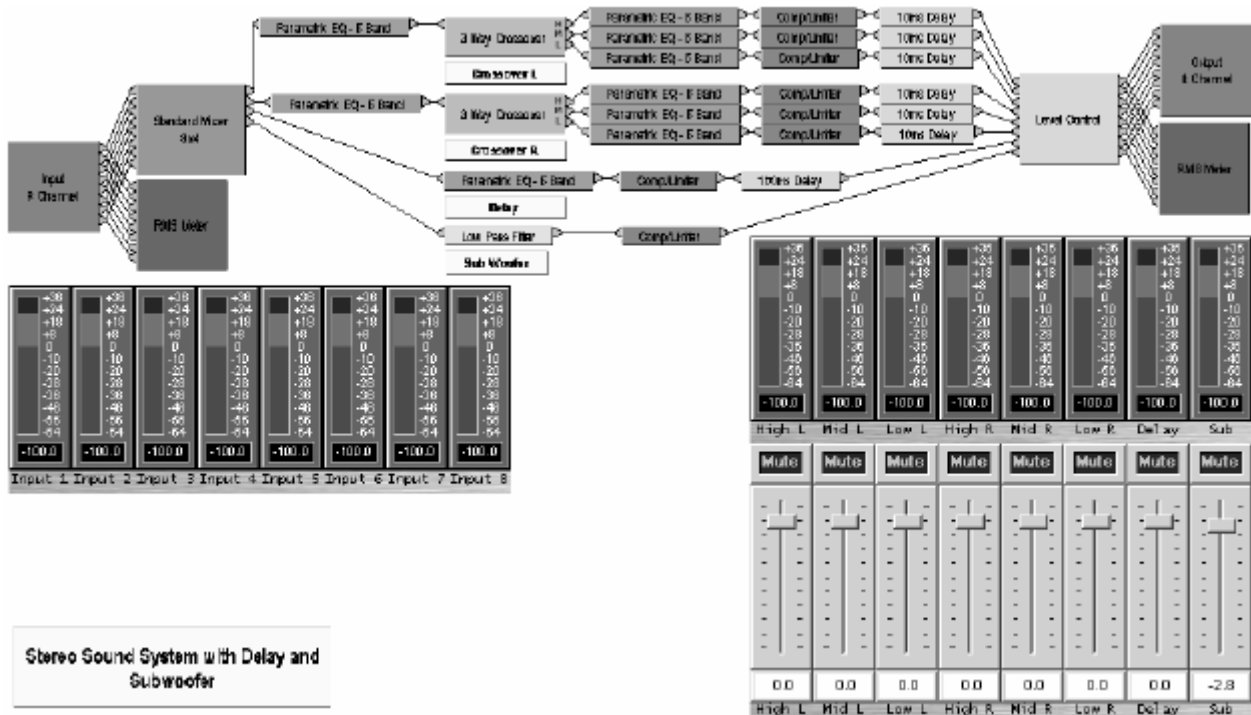
Example of a system using S8 and V8 remote control devices

This example demonstrates the use of external remote controls to recall presets and adjust volume within an E Desk system. The S8 block is wired to a Remote Preset Button block where 8 presets have been assigned. One may simply select the appropriate preset on the external S8 device and activate it with the press of the button. The V8 block has been programmed to control an 8 channel Level Control block. One can select the appropriate channel on the external V8 device and adjust the level by turning the rotary encoder.



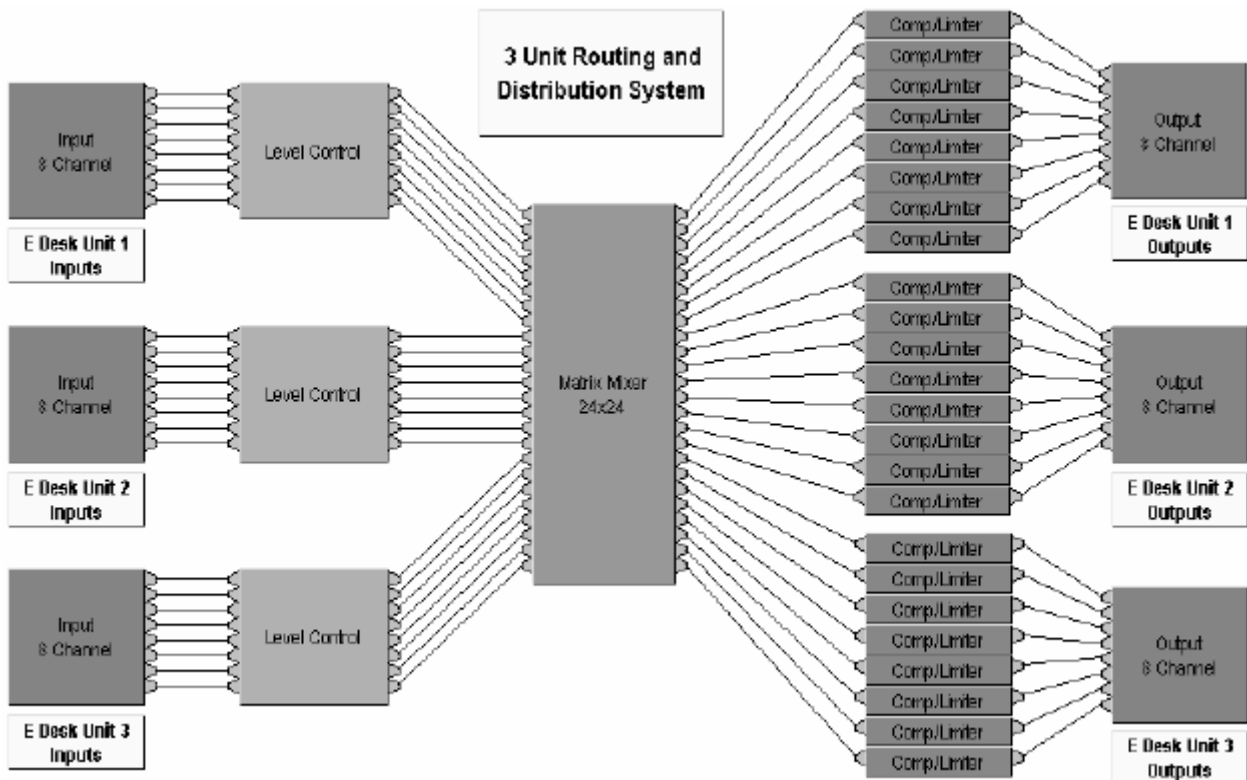
Example of a stereo sound system with delay and subwoofer.

This example demonstrates an 8x8 E Desk unit utilized in a live sound application. 8 line inputs feed an 8x4 Standard Mixer. Audio is routed from the mixer to both left and right channels of a 3-Way Crossover. A five-band Parametric Equalizer is provided at each Crossover output channel for precise driver equalization. A mono Delay line output is provided for delayed speakers, as well as a Low Pass Filter output for a mono subwoofer. A Level Control for each output provides precision volume control. This example also includes a Comp/Limiter on each channel and RMS Meters on both the input and the output of the system.



Example of a 3 unit audio distribution/routing system.

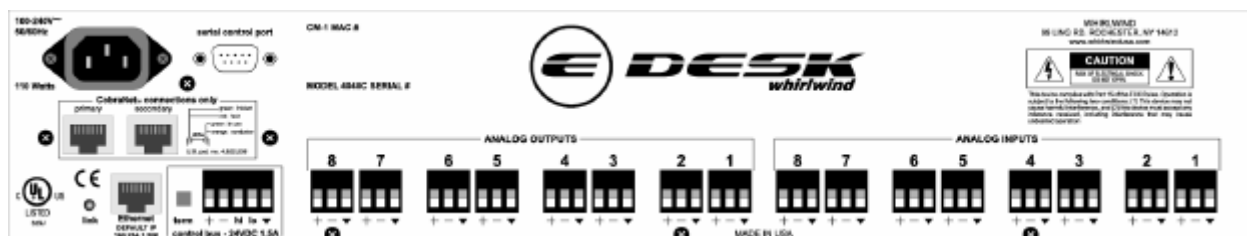
This example demonstrates three 8x8 E Desk units used in a large audio distribution and routing system. Such a system could be used for paging or background music distribution in a very large hotel or convention center. Each of the three units is connected via CobraNet using Cat5 cable with a 10/100 Base-T Ethernet switch. *Note: dotted blue lines represent CobraNet connections.* In this example we have a total of 24 audio inputs, each with its own Level Control. The 24x24 Matrix Mixer allows audio from any source to be routed to any combination of outputs. A Comp/Limiter is included on each output channel in this example.



Hardware

E Desk Hardware

E Desk™ is a 2RU chassis with CobraNet™. It has 8-in & 8-out (8x8). Inputs & outputs are analog, with internal 24-bit A/D & D/A converters, operating at a sample rate of 48kHz. All internal processing is digital (DSP). CobraNet 8x8 input/output expanders are also available (see DCS88 and E Snake).



Inputs & Outputs: Inputs & outputs are provided on balanced plug-in barrier-strip connectors. For unbalanced input, wire high to (+) and ground to both (▼) & (-). For unbalanced output, wire high to (+) and ground to (▼), leaving (-) unconnected. With **E Desk**, inputs can be individually programmed to accept either microphone or line level signals. Outputs provide line level signal only.

Ethernet: All **E Desk** units use Ethernet, both for system programming & control. Programming is accomplished using the **E Desk** software provided with each unit. **E Desk** software is for PC computers, with Windows NT 4.0/2000/XP operating system required. The PC computer must have a network card installed, which supports 10/100BaseT Ethernet. A 10/100Base-T Ethernet switch (not hub) is required when networking multiple units (see System Network Considerations). Ethernet utilizes standard CAT-5 cabling, which has a specified maximum length of 100 meters. However, Ethernet switches which provide fiber-optic interface can be used to extend the physical distance between units within a network.

Remote Control Bus: The Remote Control Bus provides the connection for V8, S8, VS8, and Voltage Command Box external control devices. (See Control Bus for more information).

CobraNet™: **E Desk** units use CobraNet and can automatically share digital audio & DSP resources within a system, allowing seamless networking. The **E Desk** CobraNet interface supports 64 channels of digital audio (32-in & 32-out), over Fast Ethernet, and is compatible with other CobraNet compliant devices. Therefore, **E Desk** can also be networked with CobraNet products from other manufacturers, expanding the system configuration capabilities. A 10/100Base-T Ethernet switch (not hub) is required when networking multiple units (see System Network Considerations). CobraNet utilizes standard CAT-5 cabling, which has a specified maximum length of 100 meters. However, additional Ethernet switches, or switches which provide fiber-optic interface, can be used to extend the physical distance between units within a network. The primary and secondary CobraNet ports are redundant.

Serial Control Port: After initial programming & configuration, **E Desk** systems may be controlled by RS-232 or Telnet communication from third-party control systems such as AMX® or Crestron®, using the Serial Control Port.

Power Entrance: The Power Entrance provides for connection of the appropriate power cord (included with unit). An internal universal switching power supply accepts 100~240VAC @ 50/60Hz, with a maximum power consumption of 115 Watts.



Front Panel Indicators: The Front Panel Indicators (**I/O**, **Com**, & **Status**) are 2-color LEDs.

The following table lists their behaviors:

I/O LED: green

Com LED: green

Status LED: green

Normal operating state. Application framework successfully executed. Configuration was successful (if applicable). Device is in a stable state awaiting commands.

I/O LED: red

CM-1 error

Daughterboard error

Com LED: red

Serial port error

Ethernet error

CAN bus error

No IP address defined (cleared by setting an IP address)

Status LED: red

Configuration error

Last configuration unsuccessful (cleared by 'reset/initializing' the device)

Operating system resource error

File system error

DSP error

All LEDs blinking

Operating system is not executing. Device must be power-cycled.

Status LED blinking

The firmware has attempted to perform an illegal operation. Device must be power-cycled.

DCS88 Transceivers

Each DCS88 can convert 8 mic or line analog inputs to CobraNet™ digital audio protocol and transmit them over a network to other CobraNet compliant devices. In addition, each DCS88 unit is capable of receiving 8 channels of CobraNet digital audio and converting it back into analog line level outputs. A DCS88 can simply add inputs/outputs to a centralized system, or it can extend system boundaries by providing inputs/outputs in remote locations. Each DCS88 unit is represented in E Desk software as separate input and output blocks (see DCS88 Input and DCS88 Output). The DCS88 may also be used with other CobraNet compliant devices.



See DCS88 operation manual for more complete information.

E Snake

The main components of the Whirlwind E Snake™ system consist of E Snake Frames (ESF) and E Snake Control™ software for managing the system. Two or more of these frames connected to each other through a 100Mb Ethernet switch with CAT-5 or fiber optics replace the traditional analog multipair audio snake. E Snake utilizes CobraNet®, the industry standard for real-time, multi-channel networked audio.

Each E Snake ESF consists of a hardware frame and motherboard that can be configured with up to four input cards (MLI) and up to four output cards (MLO). Each card is capable of processing eight channels of audio. Therefore, each frame is capable of simultaneously transmitting and receiving up to 32 channels of audio. Multiple frames can be used with Gigabit switches to increase the capacity to literally HUNDREDS of channels if required.

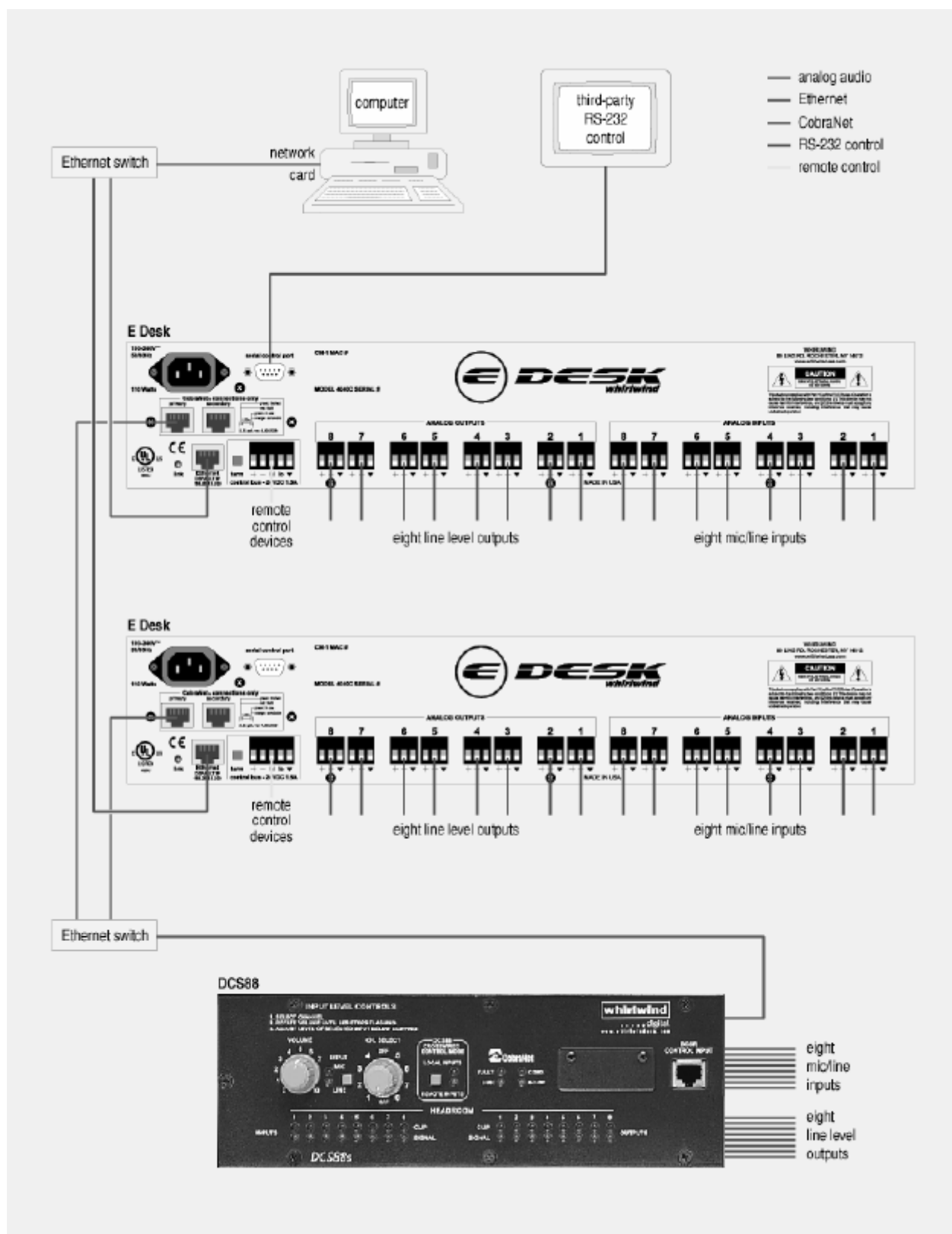


See E Snake operation manual for more complete information.

System Connections

For wiring information on specific connectors, see E Desk Hardware , System Network Considerations, and Control Bus.

Example of connections for a system with 24 inputs and 24 outputs



System Control

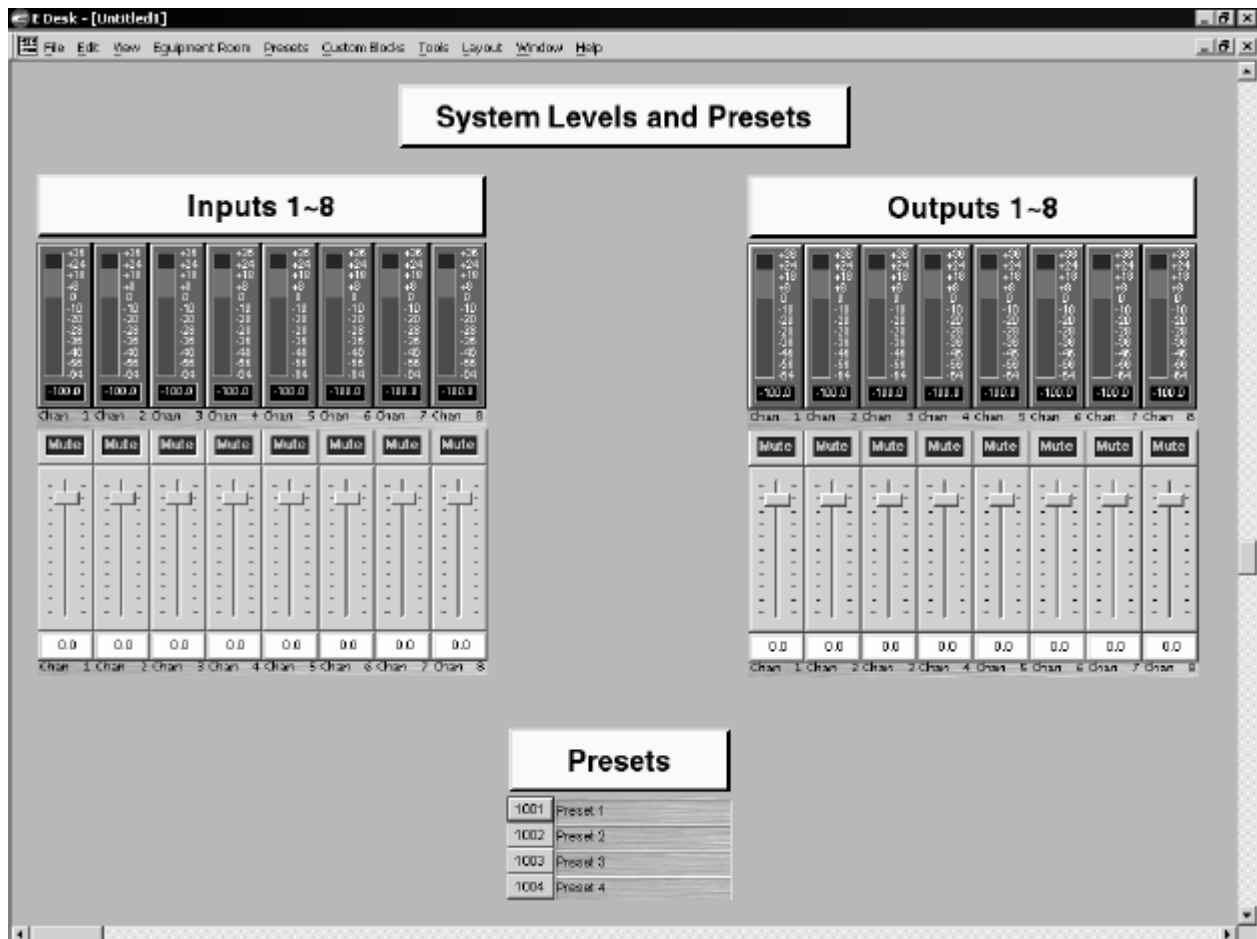
Software User Interface

Once a system design is compiled and downloaded into **E Desk** devices, the system can be controlled in real-time the via the **E Desk** software. The extent of control can be limited with different password levels.

In addition, Control Dialog Boxes for certain Combiners, Dynamics, Controls, & Meters components can be minimized to create customized control surfaces (room combiners, meters, level controls, mute buttons, & preset buttons). These control surfaces can then be made accessible to the User, only with a specific Password.

These control surfaces remain functional, even if other component settings are made inaccessible to the User (via Password Level). The control surfaces can also remain visible, even if the components they represent are made invisible (via Layer View). Therefore, a custom User control surface can be created in the Layout, with User access allowed, but with all other system settings inaccessible (and hidden). The size & shape of the Layout may be changed, and Toolbars hidden, to customize the appearance of the User control screen.

Example of simple 8x8 system user control surface



Remote Control Bus

Remote Control Bus provides the connection for V8, S8, VS8, and Voltage Command Box external control devices.

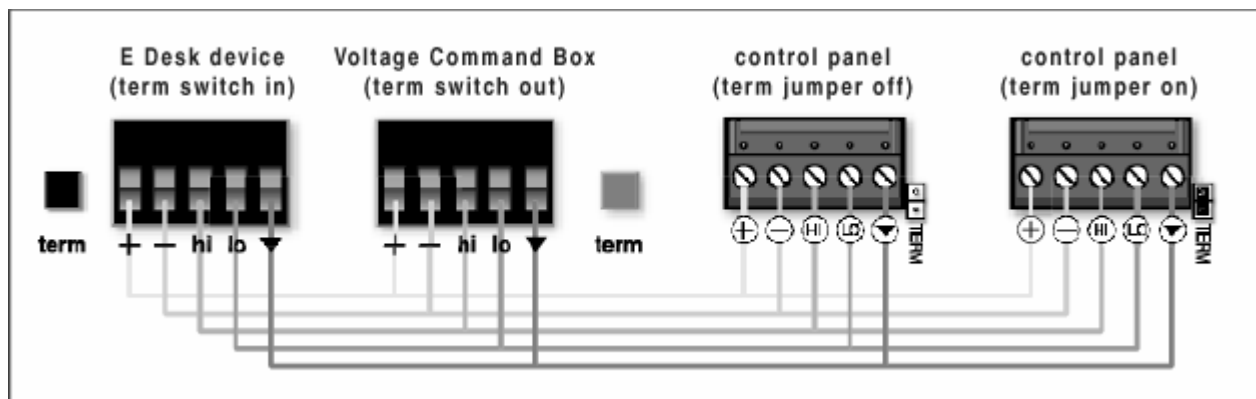
Each E Desk device can support any combination of the controls mentioned above. Up to 32 controls may be connected to each E Desk device, on a daisy-chain 'network', with a maximum cable length of 1000 feet (300 meters). Controls are wired in parallel (pin-for-pin), using 5-conductor data grade cable (95~120 ohms nominal impedance; 16 pF/ft. max. capacitance; 65% min. velocity of prop.).

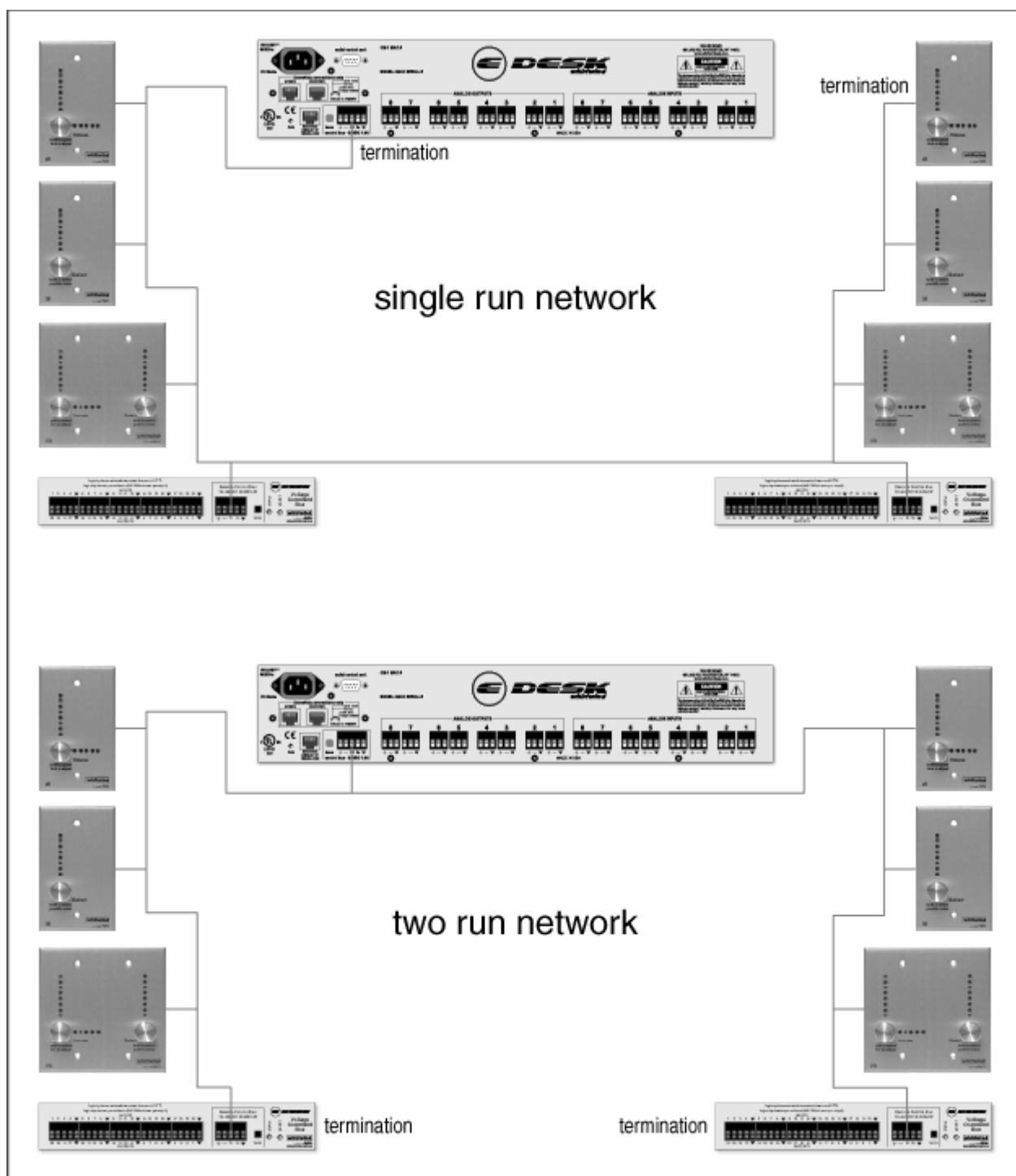
Recommended cable: Gepco UNC220 or equivalent
(use data pair for Hi & Lo; use power pair for + & -).

The 'network' requires termination at each 'end' for proper operation. All controls (and Audia) include either a termination switch or jumper strap. These terminations should be disabled (switch out or jumper removed) on all devices except those at the two extreme ends of the network. (See wiring diagram below).

A control network may be wired with the E Desk device at one end, and a control device at the other end, creating one continuous run. In this case, the E Desk device would have the 'term' switch engaged (in), and the control device at the other end of the network would have the 'term' switch engaged (in) or jumper installed. All other controls, between the E Desk device and the last control, would have their 'term' switches released (out) or jumpers removed.

If a control network needs to service two areas which are in opposite directions from the E Desk device, a network with two separate runs can be created. This type of network actually remains as a single run, but is configured with the E Desk device in the middle. Therefore, only the controls at the two extreme ends of the network would have their 'term' switches engaged (in) or jumpers installed. All other controls (including the E Desk device), between the two end controls, would have their 'term' switches released (out) or jumpers removed. (See network diagrams below.)





Third-Party Control

After initial programming & configuration, E Desk systems may be controlled by RS-232 communication from third-party control systems such as AMX® or Crestron®, using the Serial Control Port. See RS-232 and Telnet Protocol.

RS-232 and Telnet Protocol

Basics

E Desk can be controlled via customized control dialogs in the E Desk software, or via third-party controllers using RS-232 or Telnet.

For RS-232 or Ethernet (Telnet) control of E Desk, Whirlwind created ETP (E Desk Text Protocol). This simply means that E Desk will accept strings of ASCII characters to control and read settings of gain, mute, logic state, frequency, audio levels, and other parameters of DSP blocks that exist in E Desk.

ETP strings can be sent via third-party controllers using RS-232 or Telnet via TCP/IP. A line feed needs to be sent after each command string sent. (RS-232 Control) (Telnet Control)

The ETP string is structured in the following order: Command Device Number Attribute Instance ID Number Index1 Index2 Value <LF>

ETP strings require a space between each parameter; the last character in the string needs to be a line feed <LF>.

For each control string a few components will need to be derived from the E Desk software; Device Number, Instance ID Number, and Index. Command and Attribute are derived from this document. In a SET command, Value is used to specify what the DSP block is to be set to. In an increment or decrement (INC or DEC) command Value is used to specify how much the DSP block is to be changed by.

****Note**** E Desk software will assign an Instance ID Number to each DSP block on the initial Compile of the system. Subsequent Compiles will not change the Instance ID Numbers unless the "Reassign Instance IDs" check box is selected under Compile Options.

Example: A string to control a fader might look like this:

SET 1 FDRLVL 2 1 9 <LF>. The individual components for this string are:

Command	Device Number	Attribute	Instance ID Number	Index1	Index2	Value	Line feed
SET	1	FDRLVL	2	1		9	<LF>

Notice that Index2 is not used since there is nothing entered in this parameter.

Example: A string to mute a standard mixer output might look like this:

SET 3 SMMUTEOUT 5 5 1 <LF> The individual components for this string are:

Command	Device Number	Attribute	Instance ID Number	Index1	Index2	Value	Line feed
SET	3	SMMUTEOUT	5		5	1	<LF>

Notice that Index1 is not used since there is nothing entered in this parameter.

Example: A string to turn up a cross point on a matrix mixer might look like this:

INC 2 MMLVLXP 4 3 2 1 <LF> The individual components for this string are:

Command	Device Number	Attribute	Instance ID Number	Index1	Index2	Value	Line feed
INC	2	MMLVLXP	4	3	2	1	<LF>

In this example Index1 and Index2 are both used; together they specify which cross point is to be changed.

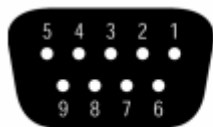
RS-232 Control

The RS-232 port on the back of an E Desk unit is set to a default baud rate of 38400, 8 data bits, no parity, 1 stop bit, and no flow control. (38400:8:None:1). If multiple E Desk units are connected together in a system then only one RS-232 port needs to be connected to a third-party control system; communication data is shared via Ethernet through a switch.

When controlling multiple E Desk units that are not part of the same DAP file, each E Desk unit will need to be addressed via its own RS-232 port from a control system or PC. E Desk units cannot be linked together via RS-232.

(The RS-232 baud rate can be set to 9600, 19200, or 38400 – default is 38400)

A straight through PC Serial Cable is used to communicate from an RS-232 port on a third-party controller (or PC*) to the RS-232 port located on the back of an E Desk unit.



pin #1 = not used
pin #2 = Transmit Data (TxD) output
pin #3 = Receive Data (RxD) input
pin #4 = not used
pin #5 = ground

pin #6 = not used
pin #7 = not used
pin #8 = not used
pin #9 = not used

(* A PC can be used with a terminal emulator program, such as HyperTerminal etc, to send/receive ETP Strings... E Desk software must be connected via Ethernet in order to communicate.)

Telnet Control

E Desk can be controlled using Telnet via TCP/IP. The same command strings that are used via RS-232 are used for Telnet as well.

When controlling multiple E Desk units that are not a part of the same DAP file, each Audia unit will need to be addressed via its own Telnet session from a control system or PC.

Command

SET – Tells E Desk that a DSP attribute is to be set to a specific value – may contain negative number and/or decimal points

GET - Tells E Desk that a DSP attribute is to be read - Response may contain a decimal point and/or a negative number.

INC - Tells E Desk that a DSP attribute is to be incremented by a specific amount

DEC- Tells E Desk that a DSP attribute is to be decremented by a specific amount

RECALL – Tells E Desk that a preset is to be recalled.

SETL and GETL can be used if negative numbers and/or decimals are not supported by a control system.

SETL – Tells E Desk that a DSP attribute is to be set to a specific value, no decimal places or negative numbers – To convert a dB number: add 100 to the desired level and then multiply by 10.

Example: To set a level to –60.5dB, add 100 ($-60.5 + 100 = 39.5$). Then multiply by 10 ($39.5 \times 10 = 395$). Instead of Value being –60.5, Value after this SETL command will equal 395.

GETL - Tells E Desk that a DSP attribute is to be read without negative numbers or decimals. To convert this number to dB: divide the number by 10, then subtract 100.

Example: With a returned GETL response of 405, divide by 10 ($405 / 10 = 40.5$), then subtract 100 ($40.5 - 100 = -59.5$ dB)

For your reference, the SETL/GETL table shows .5dB increments converted into the SETL/GETL format.

Some Attribute do not support all commands. The Attribute section defines which commands support SET/SETL, GET/GETL, INC, or DEC functions. RECALL is only used on preset commands.

*When GET or GETL is used, a Value will not need to be specified since GET/GETL is a request command. A Value must be specified in order for strings with SET/SETL, INC, DEC, and RECALL to work.

Level	Value	Level	Value	Level	Value	Level	Value	Level	Value
12	1120	-10.5	895	-33	670	-55.5	445	-78	220
11.5	1115	-11	890	-33.5	665	-56	440	-79.5	215
11	1110	-11.5	885	-34	660	-56.5	435	-79	210
10.5	1105	-12	880	-34.5	655	-57	430	-79.5	205
10	1100	-12.5	875	-35	650	-57.5	425	-80	200
9.5	1095	-13	870	-35.5	645	-58	420	-80.5	195
9	1090	-13.5	865	-36	640	-58.5	415	-81	190
8.5	1085	-14	860	-36.5	635	-59	410	-81.5	185
8	1080	-14.5	855	-37	630	-59.5	405	-82.5	175
7.5	1075	-15	850	-37.5	625	-60	400	-83	170
7	1070	-15.5	845	-38	620	-60.5	395	-83.5	165
6.5	1065	-16	840	-38.5	615	-61	390	-84	160
6	1060	-16.5	835	-39	610	-61.5	385	-84.5	155
5.5	1055	-17	830	-39.5	605	-62	380	-85	150
5	1050	-17.5	825	-40	600	-62.5	375	-85.5	145
4.5	1045	-18	820	-40.5	595	-63	370	-86	140
4	1040	-18.5	815	-41	590	-63.5	365	-86.5	135
3.5	1035	-19	810	-41.5	585	-64	360	-87	130
3	1030	-19.5	805	-42	580	-64.5	355	-87.5	125
2.5	1025	-20	800	-42.5	575	-65	350	-88	120
2	1020	-20.5	795	-43	570	-65.5	345	-88.5	115
1.5	1015	-21	790	-43.5	565	-66	340	-89	110
1	1010	-21.5	785	-44	560	-66.5	335	-89.5	105
.5	1005	-22	780	-44.5	555	-67	330	-90	100
0	1000	-22.5	775	-45	550	-67.5	325	-90.5	95
-.5	995	-23	770	-45.5	545	-68	320	-91	90
-1	990	-23.5	765	-46	540	-68.5	315	-91.5	85
-1.5	985	-24	760	-46.5	535	-69	310	-92	80
-2	980	-24.5	755	-47	530	-69.5	305	-92.5	75
-2.5	975	-25	750	-47.5	425	-70	300	-93	70
-3	970	-25.5	745	-48	520	-70.5	295	-93.5	65
-3.5	965	-26	740	-48.5	515	-71	290	-94	60
-4	960	-26.5	735	-49	510	-71.5	285	-94.5	55
-4.5	955	-27	730	-49.5	505	-72	280	-95	50
-5	950	-27.5	725	-50	500	-72.5	275	-95.5	45
-5.5	945	-28	720	-50.5	495	-73	270	-96	40
-6	940	-28.5	715	-51	490	-73.5	265	-96.5	35
-6.5	935	-29	710	-51.5	485	-74	260	-97	30
-7	930	-2.5	705	-52	480	-74.5	255	-97.5	25
-7.5	925	-30	700	-52.5	475	-75	250	-98	20
-8	920	-30.5	695	-53	470	-75.5	245	-98.5	15
-8.5	915	-31	690	-53.5	465	-76	240	-99	10
-9	910	-31.5	685	-54	460	-76.5	235	-99.5	5
-9.5	905	-32	680	-54.5	455	-77	230	-100	0
-10	900	-32.5	675	-55	450	-77.5	225		

Table of SETL and GETL levels converted from floating-point numbers.

Device Number

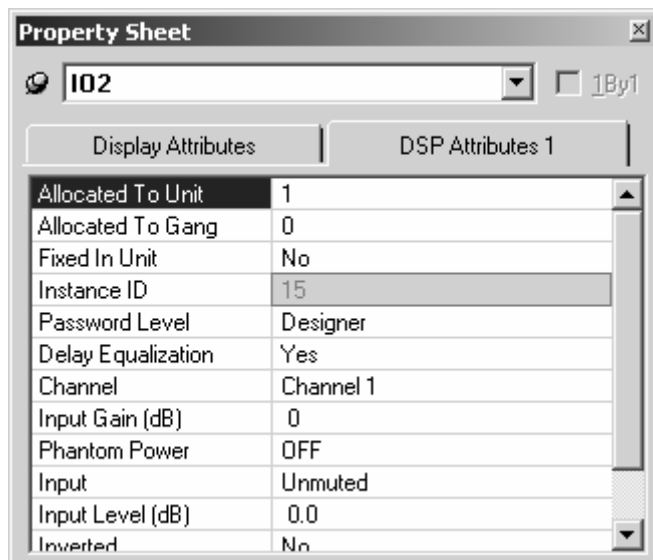
An E Desk Device Number represents the physical E Desk box's defined address. The E Desk software automatically sets this number when a system is Compiled and loaded.

The Device number that a DSP block has been assigned to can be determined in two ways:

First Way:

- 1) Right click on the DSP block and select 'Properties'.
- 2) Click on DSP 1 attributes tab and scroll down. The device that the block is assigned to will be displayed in the 'Allocated To Unit' field.

*Note: Each DSP block can be assigned to a device by changing 'Fixed In Unit' to 'Yes' (this is defaulted to no).



Second Way:

In the Display Options tab select "Display Device Assignment in DSP Block info field".

This will display the device that each DSP block is assigned to on the main screen.



Third Way:

While connected to an E Desk's RS-232 port, type the string; GET 0 DEVID

E Desk will return the Device Number of the unit you are connected to.

Attribute

The Attribute defines the portion of the DSP block to be controlled (fader level, crosspoint mute etc). The following tables show whether each ETP Attribute supports SET/SETL, GET/GETL, INC, and DEC Commands, as well as the Value range that the Attribute will accept. Index1/Index2 determines whether Index1, Index2 or BOTH are needed for a ETP String to be complete.

ETP Strings can address: (click on the links to view the tables in each topic)

[Input/Output Blocks](#)

[Mixer Blocks](#)

[Equalizer Blocks](#)

[Filter Blocks](#)

[Crossover Blocks](#)

[Dynamics Blocks](#)

[Router Blocks](#)

[Delay Blocks](#)

[Control Blocks](#)

[Meter Blocks](#)

[Generator Blocks](#)

Input/Output Blocks

Analog Inputs	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Input Gain	MICGAIN	Y	Y	Y	Index1	0 ~ 66 *
Input Level	INPLVL	Y	Y	Y	Index1	-100 ~ 12 *
Phantom Power	PHPWR	Y	Y	N	Index1	0 = off 1 = on
Input Mute	INPMUTE	Y	Y	N	Index1	0=unmuted 1=muted
Invert Polarity	INPINVRT	Y	Y	N	Index1	0=normal 1=inverted

* Can contain a decimal number.

Example: In the command: SET 1 INPLVL 6 3 -10<LF>

We are telling E Desk device 1 to set an input fader, Instance ID 6, input 3 (index1), to -10dB. (We set channel 3 input level of instance 6 to -10dB)

Analog Outputs	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Output Level	OUTLVL	Y	Y	Y	Index2	-100 ~ 0 *
Output Mute	OUTMUTE	Y	Y	N	Index2	0=unmuted 1=muted
Invert Polarity	OUTINVRT	Y	Y	N	Index2	0=Normal 1=inverted
Mic level pad	OUTPAD	Y	Y	N	Index2	0 = off 1 = on

* Can contain a decimal number.

Example: In the command: SET 2 OUTMUTE 3 4 1<LF>

We are telling E Desk device 2 to set the output mute Instance ID 3, output 4 (index1) to on. (We muted the 4th output of Instance ID 3 of an E Desk)

CobraNet Input	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
CobraNet RX bundle	CNINBNDL	Y	Y	N	None	0 ~ 61439
CobraNet Input Level	CNINLVL	Y	Y	Y	Index1	-100 ~ 12 *
CobraNet Input Mute	CNINMUTE	Y	Y	N	Index1	0=unmuted 1=muted
CobraNet Input Invert	CNININVRT	Y	Y	N	Index1	0 = off 1= on

* Can contain a decimal number.

CobraNet Output	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
CobraNet TX Bundle	CNOUTBNDL	Y	Y	N	None	0 ~ 61439
CobraNet Output Level	CNOUTLVL	Y	Y	Y	Index1	-100 ~ 0 *
CobraNet Output Mute	CNOUTMUTE	Y	Y	N	Index1	0=unmuted 1=muted
CobraNet Output Invert	CNOUTINVRT	Y	Y	N	Index1	0 = off 1= on

* Can contain a decimal number.

DCS88 Input	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
DCS88 RX Bundle	EXPIBNDL	Y	Y	N	None	0 ~ 61439
DCS88 Input Level	EXPILVL	Y	Y	Y	Index1	-100 ~ 12 *
DCS88 Input Mute	EXPIMUTE	Y	Y	N	Index1	0=unmuted 1=muted
DCS88 Input invert	EXPIINVRT	Y	Y	N	Index1	0 = off 1= on

* Can contain a decimal number.

DCS88 Output	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
DCS88 TX Bundle	EXPOBNDL	Y	Y	N	None	0 ~ 61439
DCS88 Output Level	EXPOLVL	Y	Y	Y	Index1	-100 ~ 0 *
DCS88 Output Mute	EXPOMUTE	Y	Y	N	Index1	0=unmuted 1=muted
DCS88 Output invert	EXPOINVRT	Y	Y	N	Index1	0 = off 1= on

* Can contain a decimal number.

MLI Input	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
MLI RX Bundle	EXPIBNDL	Y	Y	N	None	0 ~ 61439
MLI Input Level	EXPILVL	Y	Y	Y	Index1	-100 ~ 12 *
MLI Input Mute	EXPIMUTE	Y	Y	N	Index1	0=unmuted 1=muted
MLI Input invert	EXPIINVRT	Y	Y	N	Index1	0 = off 1= on

* Can contain a decimal number.

MLO Output	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
MLO TX Bundle	EXPOBNDL	Y	Y	N	None	0 ~ 61439
MLO Output Level	EXPOLVL	Y	Y	Y	Index1	-100 ~ 0 *
MLO Output Mute	EXPOMUTE	Y	Y	N	Index1	0=unmuted 1=muted
MLO Output invert	EXPOINVRT	Y	Y	N	Index1	0 = off 1= on

* Can contain a decimal number.

Mixer Blocks

Automixer	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Input Level	AMLVLIN	Y	Y	Y	Index1	-100 ~ 12 *
Output Level	AMLVLOUT	Y	Y	Y	None	-100 ~ 12 *
Input Mute	AMMUTEIN	Y	Y	N	Index1	0=unmuted 1=muted
Output Mute	AMMUTEOUT	Y	Y	N	None	0=unmuted 1=muted
Crosspoint Mute	AMMUTEXP	Y	Y	N	Index1	1=unmuted 0=muted
Logic Output	AMLOGOUT	Y	Y	N	Index 2	0=off 1=on

* Can contain a decimal number.

Example: In the command: SET 1 AMMUTEXP 3 1 0<LF>

We are telling E Desk device 1 to set the automixer's crosspoint (row 1, column 1) on instance ID 3 to off.

Note: for attributes with 2 Index fields, Index1 is the row, and Index2 is the column.

Matrix Mixer	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Input Level	MMLVLIN	Y	Y	Y	Index1	-100 ~ 0 *
Output Level	MMLVLOUT	Y	Y	Y	Index2	-100 ~ 0 *
Input Mute	MMMUTEIN	Y	Y	N	Index1	0=unmuted 1=muted
Output Mute	MMMUTEOUT	Y	Y	N	Index2	0=unmuted 1=muted
Crosspoint Level	MMLVLXP	Y	Y	Y	Index1 & Index2	-100 ~ 0 *
Crosspoint Mute	MMMUTEXP	Y	Y	N	Index1 & Index2	1=unmuted 0=muted

* Can contain a decimal number.

Note: for attributes with 2 Index fields, Index 1 is the row, and Index2 is the column.

Standard Mixer	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Input Level	SMLVLIN	Y	Y	Y	Index1	-100 ~ 12 *
Output Level	SMLVLOUT	Y	Y	Y	Index2	-100 ~ 12 *
Input Mute	SMMUTEIN	Y	Y	N	Index1	0=unmuted 1=muted
Output Mute	SMMUTEOUT	Y	Y	N	Index2	0=unmuted 1=muted
Crosspoint Mute	SMMUTEXP	Y	Y	N	Index1 & Index2	1=unmuted 0=muted

* Can contain a decimal number.

Note: for attributes with 2 Index fields, Index1 is the row, and Index2 is the column.

Room Combiner	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Wall State	RCMCBWALL	Y	Y	N	Index1	0 = down 1 = up
Input Level	RCMCBLVL	Y	Y	Y	Index1	-100 ~ 12 *
Input Mute	RCMCBMUTE	Y	Y	N	Index1	0=unmuted 1=muted
Group State+	RCMCBGROUP	Y	Y	N	Index1	0-16

* Can contain a decimal number.

Example: In the string SET 1 RMCMBWALL 4 2 1 <LF>

We are telling Audia to set the 2nd 'wall' in the room combiner, Instance ID 4, up (separate rooms).

Note: For wall state, Index1 represents the wall being opened or closed.

+Note: The behavior of **RCMCBGROUP** is the same as that of the "Set Selected Group" commands in the right-click-context menus in the Room Combiner control dialogue in the E Desk Software: the specified room is isolated, meaning all moveable walls at its borders are put up. All neighboring rooms maintain their previous group assignments. Index1 represents the room being addressed.

Mix-minus Combiner	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Group State	MCMBGROUP	Y	Y	N	Both	0 = not grouped 1 = grouped

Note: Index1 is the input number being addressed. Index2 is the group number; this is represented by a letter in the software, but addressed as a number in ETP commands.

(Example: A=1, B=2, C=3....)

Equalizer Blocks

Graphic EQ	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
EQ Band Level	GEQLVLBND	Y	Y	Y	Index1	-27 ~ 15 *
Bypass All Bands	GEQBYPALL	Y	Y	N	None	0 = active 1 = bypassed

* Can contain a decimal number.

The Index field represents the filter to be controlled. EQ filter farthest to the left is #1, next one is #2 and so forth. Upper left hand area of Graphic EQ dialog screen displays, which numbered filter, is being adjusted, use this number as the Index1 for Graphic EQ strings.

Example: In the string SET 2 GEQBYPALL 9 1 <LF>

We are telling E Desk to bypass all bands on Graphic EQ Instance ID 9.

Parametric EQ	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
EQ Bandwidth	PEQBWBND	Y	Y	Y	Index1	0.01 ~ 4.0 *
Bypass EQ Band	PEQBYPBND	Y	Y	N	Index1	0 = active 1 = bypassed
Center Freq.	PEQFCBND	Y	Y	Y	Index1	20 ~ 20000
EQ Band Level	PEQLVLBND	Y	Y	Y	Index1	-27 ~ 15 *
Bypass All Bands	PEQBYPALL	Y	Y	N	None	0 = active 1 = bypassed

* Can contain a decimal number.

Upper left hand area of Parametric EQ dialog screen displays, which numbered filter, is being adjusted, use this number as the Index1 for Parametric EQ strings.

Example: In the string INC 1 PEQLVLBND 11 3 2<LF>

We are telling E Desk to increment the second parametric EQ filter on Instance ID 11 by 2dB.

Feedback Suppressor	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Reset All Filters	FBSRESET	Y	N	N	None	None

Example: In the string SET 1 FBSRESET 4<LF>

We are telling E Desk to reset all of the filters on the feedback suppressor on Instance ID 4.

Filter Blocks

HPF	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cut off freq.	HPFLTFC	Y	Y	N	None	20 ~ 20000 *
Filter Bypass	HPFLTBYP	Y	Y	N	None	0 = active 1 = bypassed

LPF	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cut off freq.	LPFLTFC	Y	Y	N	None	20 ~ 20000 *
Filter Bypass	LPFLTBYP	Y	Y	N	None	0 = active 1 = bypassed

High Shelf	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cut off freq.	HSFLTFC	Y	Y	N	None	20.0 ~ 20000 *
Gain	HSFTGAIN	Y	Y	Y	None	-27.0 ~ 9.0
Filter Bypass	HSFLTBYP	Y	Y	N	None	0 = active 1 = bypassed

Low Shelf	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cut off freq.	LSFLTFC	Y	Y	N	None	20.0 ~ 20000 *
Gain	LSFTGAIN	Y	Y	Y	None	-27 ~ 9
Filter Bypass	LSFLTBYP	Y	Y	N	None	0 = active 1 = bypassed

* Can contain a decimal number.

Example: SET 1 HSFTGAIN 100 -10<LF>

We are telling E Desk to set the High Shelf filter gain on instance ID 100 to -10dB.

All Pass Filter	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Bandwidth	APFLTBWBND	Y	Y	N	Band Number	0.01 ~ 4.0 *
Center Freq.	APFLTFCBND	Y	Y	Y	Band Number	20.0 ~ 20000 *
Filter Bypass	APFLTBYPBND	Y	Y	N	Band Number	0 = active 1 = bypassed
Bypass All	APFLTBYALL	Y	Y	N	None	0 = active 1 = bypassed

* Can contain a decimal number.

Crossover Blocks

2-Way	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cutoff Freq.	XOVR2FC	Y	Y	N	Index1	20 ~ 20000 *

3-Way	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cutoff Freq.	XOVR3FC	Y	Y	N	Index1	20 ~ 20000 *

4-Way	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cutoff Freq.	XOVR4FC	Y	Y	N	Index1	20 ~ 20000 *

* Can contain a decimal number.

Example: GET 2 XOVR3FC 40 1 <LF>

We are asking E Desk to tell us the 3-way crossover low-pass cutoff frequency on instance ID 40.

2-way crossover:

Index1 = 1 is the low-pass cutoff frequency

Index1 = 2 is the high-pass cutoff frequency

3-Way crossover:

Index1 = 1 is low-pass cutoff frequency

Index1 = 2 is the lower slope of the mid cutoff frequency

Index1 = 3 is the higher slope of the mid cutoff frequency

Index1 = 4 is the high-pass cutoff frequency

4-way crossover:

Index1 = 1 is the low-pass cutoff frequency

Index1 = 2 is the lower slope of the low-mid cutoff frequency

Index1 = 3 is the higher slope of the low-mid cutoff frequency

Index1 = 4 is the lower slope of the mid-high cutoff frequency

Index1 = 5 is the higher slope of the mid-high cutoff frequency

Index1 = 6 is the high-pass cutoff frequency

Dynamics Blocks

Leveler	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Bypass	LVLRBYP	Y	Y	N	None	0=Active 1=Bypassed

Comp / Limiter	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Bypass	CLIMBYP	Y	Y	N	None	0=Active 1=Bypassed

Ducker	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Input level	DKRLVLIN	Y	Y	N	None	-100 ~ 12 *
Level sense	DKRLVLSENSE	Y	Y	N	None	-100 ~ 12 *
Bypass Ducker	DKRBYP	Y	Y	N	None	0= Active 1= Bypassed
Mute sense	DKRMUTESENSE	Y	Y	N	None	0 = unmuted 1 = muted
Input mute	DKRMUTEIN	Y	Y	N	None	0 = unmuted 1 = muted
Logic in enable	DKRENLOGIN	Y	Y	N	None	0 = disabled 1= enabled
Logic out enable	DKRENLOGOUT	Y	Y	N	None	0 = disabled 1= enabled
Logic input invert	DKRINVLOGIN	Y	Y	N	None	0= normal 1= inverted
Logic output invert	DKRINVLOGOUT	Y	Y	N	None	0= normal 1= inverted

* Can contain a decimal number.

Noise Gate	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Bypass	NGBYP	Y	Y	N	None	0 = Active 1 = Bypassed

Example: SET 3 CLIMBYP 55 0<LF>

We are telling E Desk to set the Comp/Limiter on instance ID 55 to active.

Ambient Noise Compensator	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Program Mute	ANCMUTEPGM	Y	Y	N	None	0 = unmuted 1 = muted
Program Level	ANCLVLPGM	Y	Y	N	None	-100 ~ 12 *
Program Threshold	ANCTHRSHPGM	Y	Y	N	None	-60.0 to 24 *
Program Response	ANCRSPTMPGM	Y	Y	N	None	500 to 500000*
Ambient Mute	ANCMUTEAMB	Y	Y	N	None	0 = unmuted 1 = muted
Ambient Level	ANCLVLAMB	Y	Y	N	None	-100 ~ 12 *
Ambient Threshold	ANCTHRSHAMB	Y	Y	N	None	-60.0 to 24 *
Ambient Response	ANCRSPTMAMB	Y	Y	N	None	500 to 500000*
Min Gain Setting	ANCGAINMIN	Y	Y	N	None	-25.0 to 25.0 *
Max Gain Setting	ANCGAINMAX	Y	Y	N	None	-25.0 to 25.0 *
Gain Ratio	ANCGAINRATIO	Y	Y	N	None	0.25 to 4.0 *
Gain Response Time	ANCGAINRSPTM	Y	Y	N	None	500 to 350000*

* Can contain a decimal number.

Example: SET 1 ANCMUTEPGM 20 0<LF>

We are telling E Desk to set the ANC to unmute the program input on instance ID 20.

Router Blocks

Router	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Cross point	RTRMUTEXP	Y	Y	N	Both	1 = off 0 = on

Example: SET 1 RTRMUTEXP 98 4 5 0<LF>

Note: for attributes with 2 Index fields, Index1 is the row, and Index2 is the column.

Delay Blocks

Delay	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Delay in Milliseconds	DLYMSEC	Y	Y	N	None	0 ~ ?*
Delay in Centimeters	DLYCM	Y	Y	N	None	0 ~ ?*
Delay in Meters	DLYM	Y	Y	N	None	0 ~ ?*
Delay in Inches	DLYIN	Y	Y	N	None	0 ~ ?*
Delay in feet	DLYFT	Y	Y	N	None	0 ~ ?*

* Can contain a decimal number.

Example: SET 1 DLYCM 24 40<LF>

We are telling E Desk to set the delay block at instance ID 24 to 40 centimeters.

Note: Value range is 0 to max value for the specific delay block. Example: a 50mSec delay has a maximum setting of 1763 centimeters, 17meters, 694 inches, and 57 feet.

Control Blocks

Level Faders	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Fader Levels	FDRLVL	Y	Y	Y	Index1	-100 ~ 12 *
Mute Fader	FDRMUTE	Y	Y	N	Index1	0 = unmuted 1 = muted

* Can contain a decimal number.

Presets	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Preset	PRESET	N	N	N	None	1001 to max preset number

Note: Instead of SET/SETL, GET/GETL, INC, or DEC; the preset attribute uses RECALL as the Command. Preset numbers begin at 1001, regardless of preset name (the first preset defined is 1001, the next 1002, and so forth).

Example: in the string: RECALL 2 PRESET 1001<LF>

We are telling E Desk to recall the first preset on an E Desk system. Since presets apply to entire systems, or DAP files, the Device Number will always be 1 for Preset strings.

Meter Blocks

Meters	Attribute	SET / SETL	GET / GETL	INC / DEC	Index1/ Index2	Value Range
Signal	SPMTRLVL	N	Y	N	Index1	0 = off 1 = peak
Peak	PKMTRLVL	N	Y	N	Index1	-100 ~ 36 *
RMS	RMSMTRLVL	N	Y	N	Index1	-100 ~ 36 *

* Can contain a decimal number.

Example: GET 1 RMSMTRLVL 48 1 <LF>

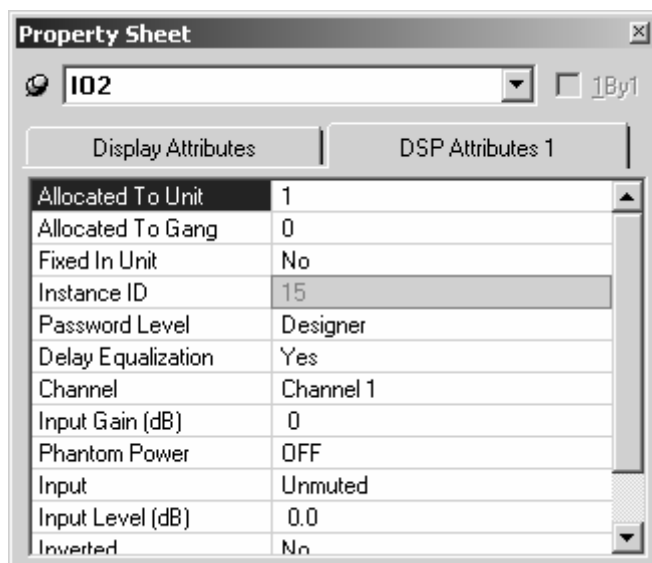
We are asking E Desk the RMS Meter 1 level on instance ID 48.

Generator Blocks

No Attributes are specified at this time

Instance ID Number

E Desk uses an instance ID number to specify the exact DSP block to be controlled. Right click on the DSP block and select "Properties", the instance number can be found the DSP Attributes 1 tab.

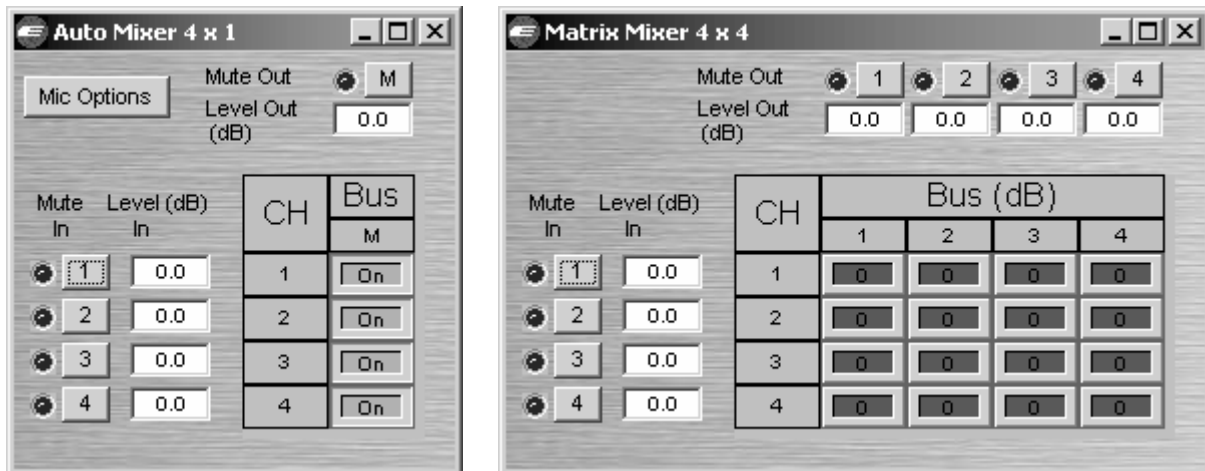


****Note**** From the factory the E Desk software will assign an instance number to each DSP block on the initial Compile of the system. Subsequent compiles will not change the Instance ID Numbers unless the "re-assign Instance IDs" check box is selected under Compile Options.

If one or more DSP blocks are disconnected from the audio path (when connections are not made to at least one input or output) the Instance IDs will be unassigned. New Instance ID(s) will be reassigned once the DSP block(s) are properly connected again.

Index

Index refers to inputs, outputs, or cross points of an Attribute. Some Attributes will need an Index1 (Input or Row) and/or an Index2 (output or Column). The tables in the Attribute section will define which, if any, indexes are required for the string.



Example: INC 1 AMLVLIN 4 1 1<LF>

In an Automatic mixer on device 1 we are increasing the level of input 1 on instance ID 4 by 1dB. Index1 is used to represent the input number.

Example: DEC 2 AMLVLOUT 6 1 2<LF>

In an Automatic mixer on device 2 we are decreasing the level of output 1 on instance ID 6 by 2dB. Index2 is used to represent the output number.

Example: SET 1 MMLXP 5 1 2 -5<LF>

In a matrix mixer on device 1 we are setting cross point 1:2 (row 1, column 2) level to -5dB on instance ID 5.

Note for commands with 2 Index fields, Index1 is the row, and Index2 is the column.

Value

Value determines what a DSP block is being set to, incremented by, or decremented by. The Attribute section will define which type of value the string will need in order to execute the ATP string.

Example: INC 1 AMLVLIN 4 1 1<LF>

In an Automatic mixer input level string, the Value equal to 1 states that the fader is to be incremented by 1 dB.

Example: SET 2 MMLVLIN 5 2 -100<LF>

In a matrix mixer input level string, the value is set to -100dB.

Example: RECALL 1 PRESET 1004<LF>

For a preset recall we are telling device 1 to recall the fourth preset.

*When GET is used, a Value will not need to be specified since GET is a request command. A Value must be set in order for SET, INC, DEC, and RECALL command strings to work.

Example: GET 4 MMLVLOUT 5 <LF>

We are asking the level of a matrix mixer's output. There is no Value required for this string.

Responses

When a successful SET, SETL, INC, DEC, or RECALL command is sent to an Audia device via RS-232 or TCP/IP, Audia will respond with: '+OK' followed by a carriage return and line feed.

Example: Sending the string: SET 2 AMLVLIN 4 2 1< LF> will result in an: +OK<CR><LF> response.

A successful GET or GETL command will result in a numerical response to the command string followed by <CR><LF>.

The response from a ATP string with a GET command can contain negative numbers, and/or decimal points, depending on type of Attribute addressed. If the control system does not support negative numbers or decimal places a GETL command may be used instead.

Example: After sending the above example to an E Desk device the string:

GET 2 AMLVLIN 4 2<LF> would result in the response: 1.0000<CR><LF> this tells us that the level is currently set to 1dB.

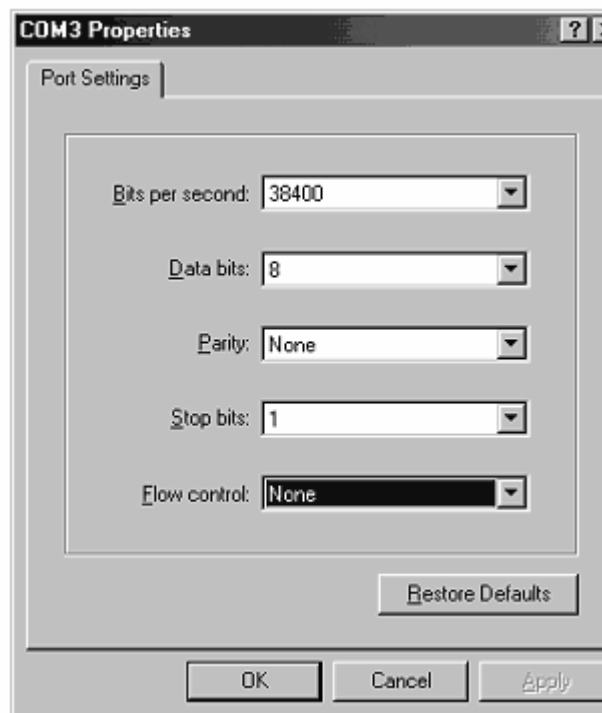
If an incorrect command string is sent, an E Desk will respond with: -ERR <CR><LF>

HyperTerminal

HyperTerminal is a useful tool that comes with Windows and can be used for RS-232 purposes. Simply open a HyperTerminal session by going to: Start> Programs> Accessories> Communications> HyperTerminal. Enter a name for your connection and click 'OK'. Under the pull-down menu labeled 'Connect Using' select the location of your RS-232 Comm. port.



Under the Comm. port properties set it to 38400, 8, None, 1, and None as shown below. Now HyperTerminal is ready to use. E Desk does not echo characters typed, so if you want to view what is being typed into E Desk, click on "echo typed characters locally" in the ASCII setup screen.



IP Address Commands

E Desk has some useful IP and reset tools that may be useful when returning to older systems for service work.

E Desk will automatically output its IP Address through the RS-232 port when it is powered up and functioning. Simply have a straight through RS-232 cable connected to E Desk and a PC with HyperTerminal running. When E Desk is powered up it will print the data in the HyperTerminal screen.

Get/Set IP Address

By typing '**GET 0 IPADDR<LF>**' in HyperTerminal E Desk will reveal the IP Address it is set to. Substituting the '0' for a 1, 2, 3, etc. will tell E Desk to reveal the IP Address for the device whose number is 1, 2, 3 etc. A '0' asks for the IP Address of the E Desk you are currently connected to. Note: You can only use a 1, 2, 3, etc. if there is a system loaded into the E Desk. If it is a single device system, the only device number will be 1.

If an E Desk does **not** have a system loaded into it, you can set the IP Address via the RS-232 port.

Example: **SET 0 IPADDR 169.254.1.200<LF>**. If there is no DAP file in the E Desk, and the command is typed correctly, E Desk will send back a '+OK' response. You will need to power cycle the E Desk for the new IP Address to take effect. As stated above, E Desk will output the IP Address when powered up, or you can use the GET IPADDR command mentioned above.

Reset

In rare instances it may become necessary to reset the E Desk device. A reset can be accomplished through the device maintenance screen, and this is the desired method for a reset. However, there is a reset command available via the RS-232 port. Simply type: **CLEAR 0 DEVCONFIG<LF>** and the device will be reset.

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